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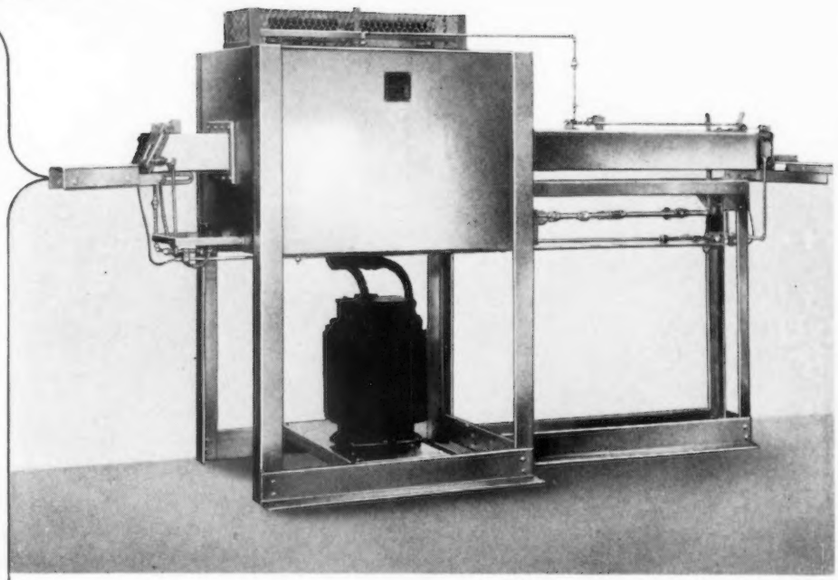

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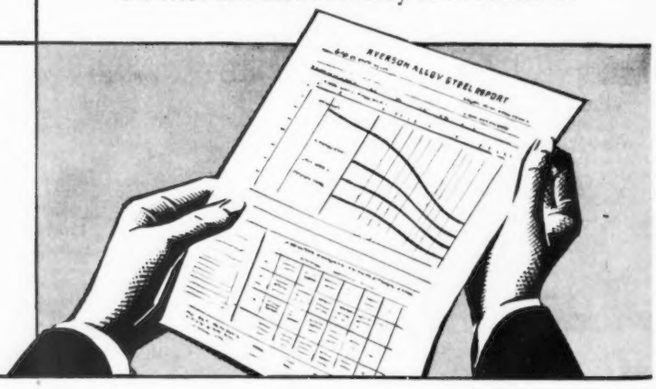

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Paging Mr. Price

I DON'T know why people wonder about there being shortages of all sorts of things today. It would be much more to wonder at if there were plenty of anything that most people want.

Five yr from now, or perhaps even in less time than that, we may be worrying about surpluses instead of shortages. But having too much, it seems to me, is better than having too little. It's easier to manage what is than what "ain't." Many of us, including government officials, are finding that out.

In an economy such as ours and in so-called "normal" times, when supply and demand occupy the see-saw, shortages do not last long, nor surpluses either. For there is an automatic adjusting device known as "price." It's function—some of us have forgotten this—is to keep production in balance with demand. Thus when demand forges ahead and supply lags behind, in an unregimented or "free' economy, Mr. Price gives the accelerator a push and the production wheels speed up. On the other hand, when demand lags behind supply, this reliable old gent needs no prompting to put on the brakes.

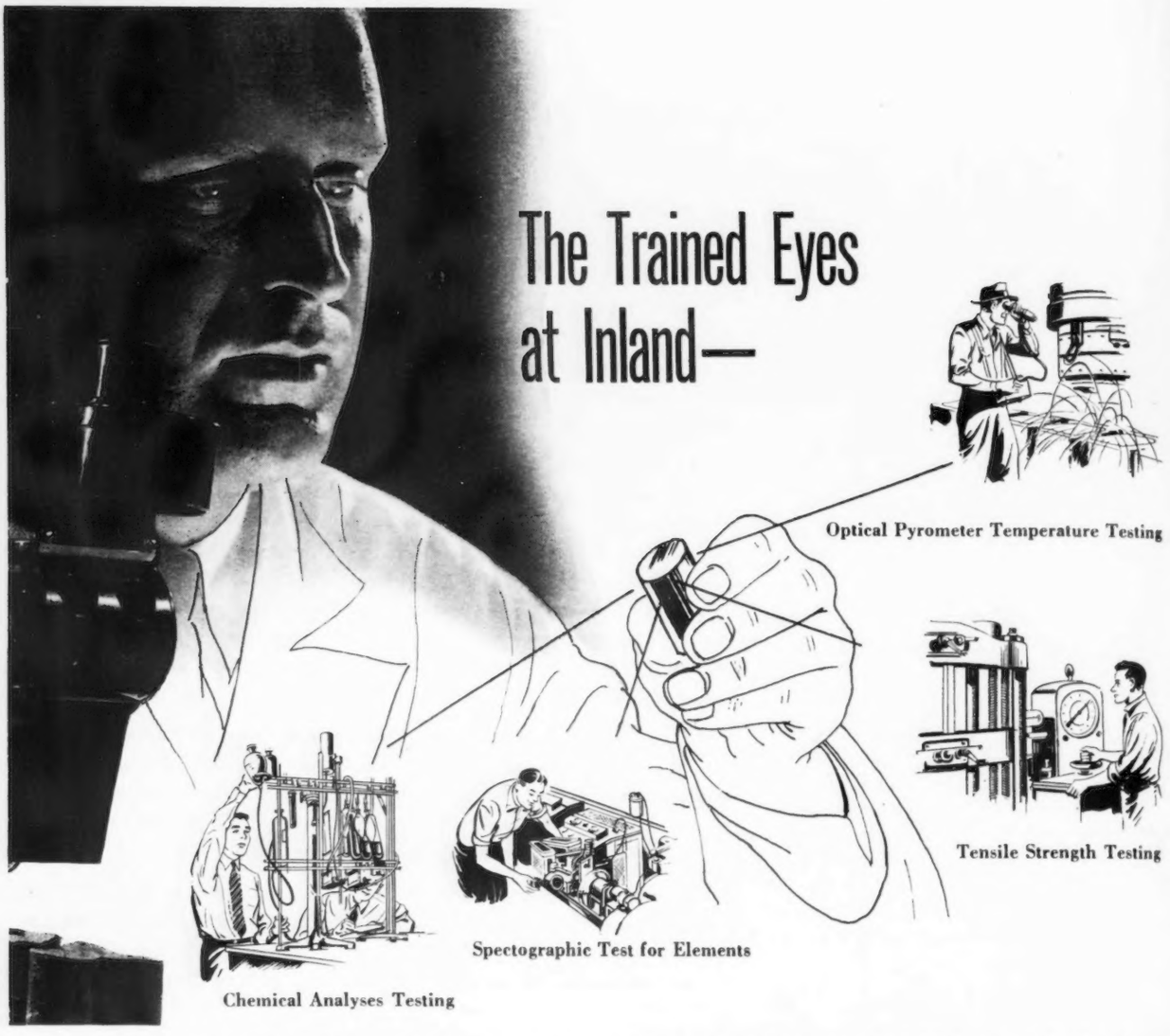
Mr. Price has been performing this valuable service (until recently) since the Year I. But today he is troubled by competition. Some people want to take over his job and in fact have done so—at least temporarily. No one has elected them to do it but they have gotten themselves appointed or anointed, whichever you choose to call it.

The trouble is that whereas Mr. Price has had 5000 yr of experience in adjusting supply and demand, these ambitious competitors of his are rank amateurs. Where he would meet a situation properly in a flash, and automatically, his rivals require months of study, armies of statisticians and hordes of assistants to arrive at the wrong answer.

Today we have an unparalleled amount of purchasing power in America. And we have the greatest shortage of goods to satisfy it. Raising wages merely adds to the discrepancy between supply and demand. Purchasing power very evidently does not stimulate productivity. It takes prices that spell profits to do that.

Mr. Price would never apply the brakes when what was needed was a touch of the accelerator. If production lagged behind demand, as it does today, he would give it the needed fillip to make it catch up. And under his management it always has.

I am afraid we cannot say that for those who have "pinched" his job!



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INLAND
STEEL

► Of 28,800 temporary houses erected since the war in the United Kingdom, only 14,600 have been completed for occupation, due to a shortage of internal fittings.

► Disposal of surplus British army vehicles, which has been proceeding through trade channels with manufacturers reconditioning each unit before disposal, is breaking down.

Auctions are now being held for mass movement, following mounting indignation at the depots lined with idle staff cars and trucks.

► British women who served in the nation's armed forces are rebelling against the monotony of factory work. To halt the mutiny, manufacturers are supplying them with brighter workrooms, fashion shows, music and training programs.

► Because of the coal shortage in Great Britain, black peat is being dug for the first time for more than a century from a 2000 year old deposit on Dartmoor near Bridestowe.

► Peacetime applications of atomic power will be undertaken at the British research station at Harwell. Its application to propel large ships is now being discussed.

► The French are looking to the semi-continuous type strip mill built during the occupation by the Firminy Steelworks to answer the need for modernization of their iron and steel industry.

Since the purchase of American mills is looked on with disfavor because of the dollar shortage and the lack of space in existing mills for a continuous mill, this type is being discussed with great interest.

► New drills offered by Republic Drill & Tool Co. will drill 3/8-in. holes, 6-in. deep, in cast iron or steel at a feed of 50 ipm. Cutting is done wet, and drills have two cutting flutes and two coolant flutes. Coolant under pressure passes down two flutes and returns through the cutting flutes, carrying chips with it.

► A new type of Swiss automatic cuts long tapers by feeding the bar stock through the collet while the tools feed slowly inwards.

► In a new boring bar design by Gairing Tool Co., tool bits are mounted in pairs in separate blocks which are inserted in slots in the bar and retained by simple spring clips. Blocks are easily removed for grinding without disturbing the setup, and equal distribution of the load on both tools is assured.

► Even after the coal strike is settled, the steel industry will have its difficulties in getting blast furnaces started again in order to reach prestrike levels.

This is the second time this year that operating men because of strike conditions have been forced to cut off blast furnaces. This action necessitates rehabilitation and relining.

► While scrap supplies may be temporarily easier in some districts, this condition is expected to be only short lived. With an extreme shortage of pig iron, many steel companies after the coal controversy is settled will have to use larger scrap charges. Therefore, no diversion from ceiling prices is in the wind.

► A British powder metallurgy development in the manufacture of de-icing strips for aircraft has been reported. The porous strips made from copper-nickel powders injected with de-icing fluid is placed along the leading edge of the plane. The fluid can be forced to emerge along the wing as required under the control of the pilot.

► After conferences with steel industry advisory members, the OPA is ready to raise prices on certain steel mill products which have disappeared from delivery schedules because of high cost and alleged inadequate price adjustment.

One way in which the OPA will insist that such adjustments are no more inflationary than the recent average $5 a ton increase in steel prices is the fact that the industry did not realize the tinplate advance because 1946 contracts were already signed.

Radiographic and Fluoroscopic Interpretation of

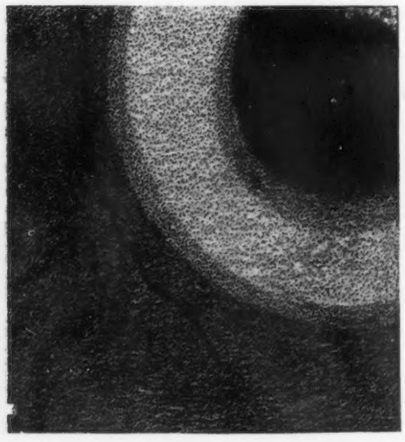
An effort to improve nondestructive inspection of quality castings for aircraft use, thus minimizing unnecessary rejections, by the use of X ray and fluoroscopic methods is described in this article. Evaluation of definition produced by the fluoroscope as compared with radiography is discussed and the appearance to the radiographer of 14 types of defects is illustrated.

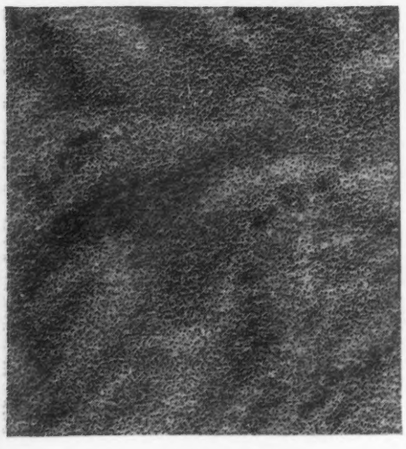
NORTHROP CO. was obliged to use castings in the Black Widow night fighter airplane where forgings and machined parts had been previously used, due to a shortage of available forging equipment and machine shop time during the war emergency. There are 1028 castings in the Black Widow having an aggregate weight of 845 lb or 5.54 pct the total weight of the plane.

Cognizant of the fact that a comparatively large number of castings were to be used in the airframe of the Black Widow, many of which were in strategic locations, the quality control inspection of castings immediately became a vital operation. Realizing a weakness in this field and a lack of knowledge of the subject, a survey was made to determine what possible steps could be taken to insure that only aircraft quality castings were accepted. Results of this survey indicated that the use of the X ray and physical destruction tests on each type of casting would give greater assurances of safety.

In order that the personnel of this plant might be properly trained in X ray methods and radiographic interpretation, three men were sent to Stanford University. Upon completion of a course in X ray and radiographic interpretation, these men established the Northrop X ray and castings quality control procedure which in short consisted of:

(1) Furnishing stress marked drawings to the X ray laboratories and foundries. Color designations of red or green on these drawings





Radiographs of Some Typical Light-Alloy Casting Defects

LEFT

CRACKS—Usually appear as single fine dark lines. A crack is caused by fracture of solid material which may occur at any stage of production after initial solidification.

RIGHT

GAS HOLES—Usually appear as smooth, well defined elongated or rounded darkened areas and are caused by gas trapped in the metal.

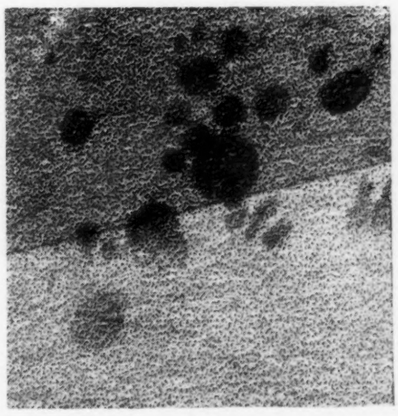
o o o

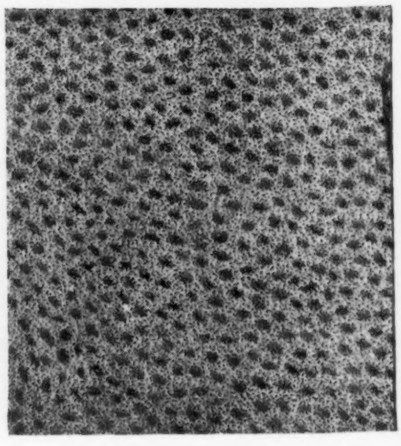
LEFT

SEGREGATION—Usually appears as elongated dendritic or filamentary light patterns. Cause is segregation of metallic constituents from parent metal. Where segregation appears to be due to contraction stresses, an associated crack may be disguised by the segregation image.

RIGHT

GAS POROSITY—Appears as well distributed peppering of rounded or irregular dark spots which may be elongated or curved. This type of porosity is caused by gas dispersed throughout the molten metal.





Casting Irregularities

By THOMAS E. PIPER
Chief Process Engineer, Northrop Aircraft, Inc., Hawthorne, Calif.

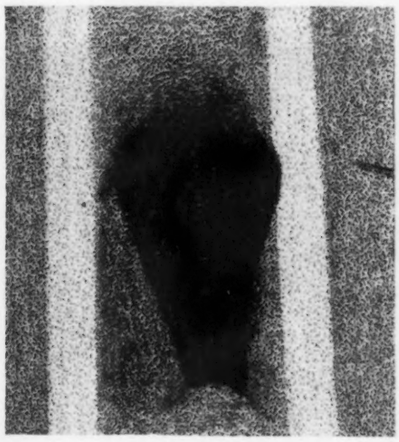
FIG. 1—Loading and unloading platform on a portable industrial fluoroscope of the type discussed in the article.

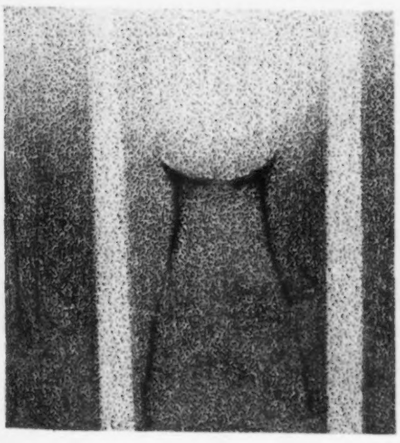
indicated primary or secondary stressed areas. Unstressed areas carried no markings.

(2) Final interpretation of radiographs by the company, thus permitting better foundry coordination and allowing Northrop to accept castings having defects in unstressed areas that normally would have been rejected.

(3) Preparing a radiographic acceptance standard for each type of casting by testing to destruction the three worst castings out of the first 100 castings poured and in accordance with specification AN-I-26.

After Northrop became more experienced in X ray methods, the practicability of using the fluoroscope as a "culling" tool to supplement radiographic inspection was considered and investigated. Two major manufacturers of X ray equipment were contacted and inquiries were made as to the possibilities of securing a fluoroscope for experimental purposes. The replies were discouraging as the fluoroscope was





Radiographs of Some Typical Light-Alloy Casting Defects

LEFT

MISRUNS—Appear as a dark area having a smooth outline of irregular dimensions. Misruns are caused by failure of molten metal to completely fill cavity of the mold and are usually detectable by visual inspection.

RIGHT

DROSS OR SLAG—Apears as irregular shaped darkened spots or areas and is caused by entrapment of dross or slag within the casting. When dross occurs in combination with gas it results in an irregular darkening within the image. Slag is usually of a regular shaped darkened spot or area.

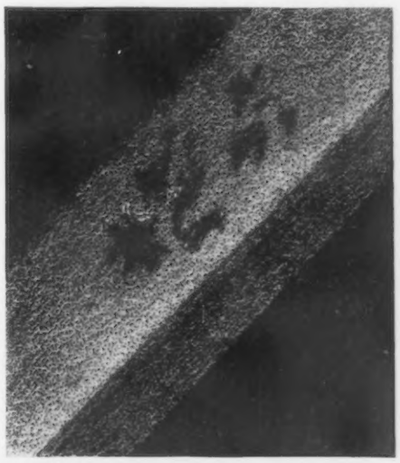
o o o

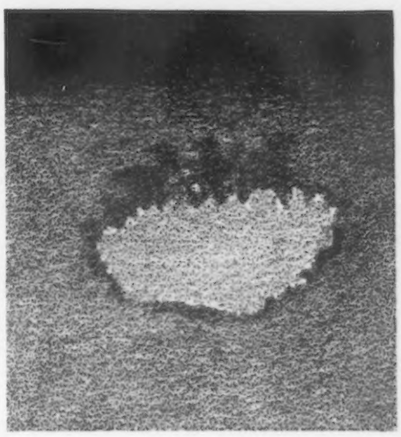
LEFT

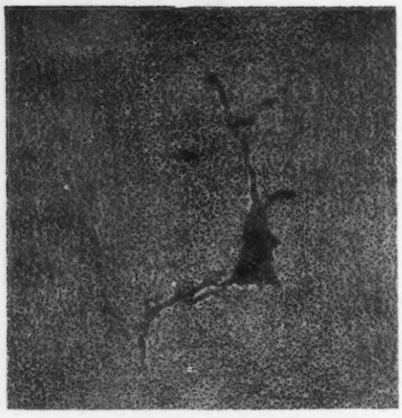
COLD SHUTS—Appear as smooth distinct lines normally of variable density and less well defined than a crack. They occur where material flows together from different directions but fails to unite.

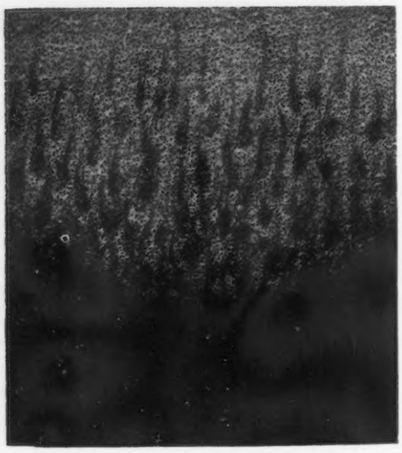
RIGHT

INCLUSIONS—Generally appear as light spots or areas caused by foreign solid matter trapped in the casting.









Radiographs of Typical Shrinkage Defects in Light-Alloy Castings

LEFT

SHRINKAGE CAVITIES—Appear as dark regions of sharp and usually jagged outlines. They occur as jagged or dendritic shaped cavities and are in general caused by contraction of liquid material in locations where feeding is inadequate.

RIGHT

CENTERLINE SHRINKAGE—Usually consists of a string of shrinkage cavities.

o o o

LEFT

SHRINK POROSITY — Appears as dark regions of irregular shapes featuring minute dendritic patterns. Is generally an overall dispersed shrinkage in which cavities are very small, resulting in a spongy type of crystalline structure.

RIGHT

PIPE—Elongated cylindrical shrinkage cavity usually parallel to directional flow of the metal.

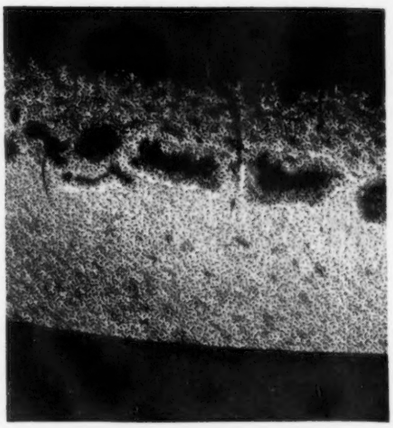
o o o

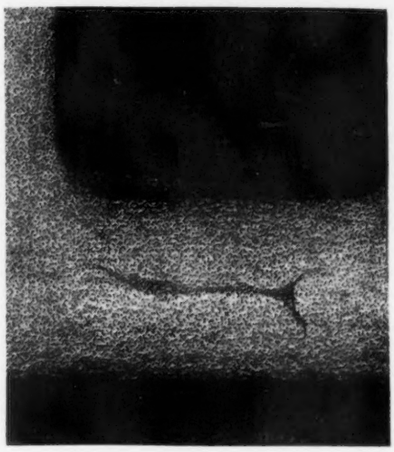
LEFT

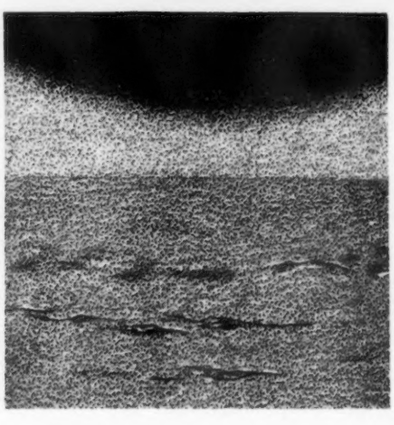
MICRO SHRINKAGE—Occurs most frequently in magnesium alloys. Appears as dark feathery streaks or dark areas and usually consists of a network of very fine cavities in the grain boundaries. Microporosity resulting from h.t.o. in heat treatment resembles micro shrinkage on the radiograph.

RIGHT

HOT TEARS—A secondary form of shrinkage which appears as variable width jagged fissures, caused by parting of material at elevated temperatures.







deemed an impractical method for casting inspection.

X-Ray Products Corp. in Los Angeles was manufacturing stereo-fluoroscopic machines for medical applications and, after discussing the problem with them, they agreed to construct a fluoroscope for experimental testing. Within three months this machine, fig. 1, was in operation.

Terminology and illustrations of irregularities contained in this paper were prepared by the West Coast Aircraft War Production Council, Radiographic Interpretation Standards Group. Acceptance of this nomenclature by national organizations is pending.

The next step was to evaluate the definition produced by the fluoroscope as compared to radiography. To accomplish this, X-Ray Products in collaboration with Northrop analyzed 489 lots totaling 33,777 castings by X raying independently through the fluoroscope and radiographic equipment and recording comparative findings. The results were very satisfactory. The fluoroscope proved to have limitations but as a culling tool for large defects and as a supplement to radiographic inspection its usefulness became apparent. Because visual acuity is not as sensitive as an X ray film in recording an image, uses for the fluoroscope were definitely limited. Radiographic sensitivity is less than 0.001 in. or ½ of 1 pct, while the fluoroscent image due to screen and eye sensitivity is 1/64 in.

The 33,777 castings (489 lots) were 25 pct radiographically X ray inspected and 155 lots were found to contain rejectable castings. The same 489 lots of

castings were 100 pct radiographically inspected and 293 lots contained rejectable castings.

The conclusions drawn from this were twofold: (1) That lots had no rejectable castings in the first 25 pct X rayed, and (2) that the fluoroscope would have screened out all rejectable castings if used prior to radiographic inspection, necessitating only 25 pct radiographic inspection.

The following table gives a comparison of inspection costs at the present time. The first cost column is the average radiographic cost per part with rejection cost included. The second column includes the combined cost of fluoroscopic and radiographic inspection cost.

Part	Average Radiographic Cost Per Part	Net Average Combined Cost, Radio and Fluoroscopic	Net Saving Per Part
Pulley Bracket	$0.81	59¢	22¢
Bracket, O.W.	1.24	69	55
Bracket, O.W.	1.32	83	49
Bracket, O.W.	1.33	71	62
Rudder Pulley Bracket	0.49	25	24
Heater Intake Scoop	1.00	31	69

Satisfied with the results obtained from this evaluation, Northrop requested that all lots of castings applicable to fluoroscopic inspection receive 100 pct inspection by the fluoroscope prior to and supplementary to 25 pct or 10 pct radiographic inspection, the percentage of the latter depending upon the classification of the casting. To save unnecessary machining of defective castings or to determine variables in wall thickness, Northrop requested that nonclassified castings sometimes be fluoroscoped or radiographed.

To further exploit the fluoroscope as an inspection tool, a program was instituted at the California Institute of Technology under the sponsorship of the Office of Production Research and Development of the War Production Board.[1] This program covered investigations to:

(1) Determine the limitations in reliability, definition and contrast of fluoroscopic methods of examination of metallic materials in comparison with radiographic methods.

(2) Determine the field of usefulness of fluoroscopic methods as supplements to or replacements of radiography of metallic materials.

(3) Extend the field of usefulness of fluoroscopy by improvements in equipment and technique.

As a result of this project, two major modifications of the fluoroscope machine were completed. These modifications included:

(1) Provision for easily controlled motion and positioning of X ray tube head beneath the specimen being inspected, both vertically so that tube-object distance could be varied, and horizontally (at right angles to the direction of the conveyor travel) so that an apparent rotation of the specimen in this direction could be obtained.

(2) Replacement of the original lead glass viewing window with a plastic cell filled with lead perchlorate, which would not darken under the very intense X rays obtained at short tube-object distances.

Two fluoroscope machines incorporating the above improvements were constructed, one by X Ray Products for production use, and the other by the California Institute of Technology for further research.

Castings, while appearing alike, have structural and dimensional irregularities. Sand, die and permanent mold castings when cast consecutively and from the same heat, contain inherent irregularities which show up in X ray and precision inspection. The control of these irregularities is the primary problem in the engineering use of castings. Because of the many variables possible while the metal is aborning, such as the quantity of ingredients, chemical segregation, finish and heat treatment, a close inspection is necessary to insure that high strength requirements and quality standards are fully satisfied.

[1] *Details of this program, together with recommendations made as a result of it, are discussed in the article "Fluoroscopy of Light-Alloy Castings,"* THE IRON AGE, *Nov. 1, 1945, p 55, and April 18, 1946, p 48.*

Irregularities common in aircraft castings, as they appear to a radiographer, and which may be corrected by changes in foundry techniques, are shown in fig. 2. In addition to the eight defects shown in fig. 2, there is another type, termed surface irregularities, which occur at the surface of the casting and are usually detectable by visual inspection. The appearance of these defects on the radiograph depends upon the nature of the irregularity. These irregularities include mold marks, excess metal, adhesions of sand or other impurities, saw cuts, indentations, etc.

The strength of aircraft castings is frequently affected by shrinkage irregularities. Freedom from shrinkage depends not only upon proper foundry practice, but also upon proper design and sufficient pattern shrinkage allowances. Northrop has found it advantageous to classify shrinkage irregularities in two categories: (1) Primary shrinkage, or shrinkage occurring prior to solidification, and (2) secondary shrinkage, or shrinkage occurring after solidification. Primary shrinkage irregularities are considered to include the shrinkage cavity, shrinkage porosity, microshrinkage, centerline shrinkage and pipe. Secondary shrinkage is considered to include hot tears and cracks. These shrinkage irregularities, as they appear to the radiographer, are shown in fig. 3.

In conclusion, the author wishes to point out the need for development and research to evaluate the effect of irregularities as shown by radiography or fluoroscopy on the parent metal and the necessity of controlling shrinkage, both primary and secondary, by a formula so as to enable the designer to design castings which a foundry will be able to manufacture. Only through a program of this nature will it be possible to produce economically quality castings on a production basis and to realize maximum benefits from radiographic and fluoroscopic control.

Radiographs covering shrink porosity and gas porosity have been slightly retouched to provide better indications of the characteristics of the appearance of these defects on the radiographs. All other illustrations are actual reproductions from the negative.

CEMENTED STEELS

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By E. S. KOPECKI
Associate Editor

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A new development of a technique that up to now has not been commercially practicable leads to the possibility of removing present day limitations of powder metallurgy of iron and steel. Complicated shapes, possessing high strength and density can now be produced, utilizing low pressures, by an "infiltration method" herein described.

POWDER metallurgy of iron and steel has advanced considerably during recent years, but limited physical properties have remained a serious obstacle. Stress concentrations caused by the porosity of the structure have led to attempts to increase the density of steel powder compacts. Since pressures that could be produced have been insufficient to give the desired results, a method of infiltration of a molten low melting metal into a steel powder compact of a higher melting temperature has been attempted. The process was recently developed to the point of being commercially successful.

Metallurgists of the American Electro Metal Corp., Yonkers, N. Y., under the direction of C. G. Goetzel, developed the infiltration method to the extent that parts, which up to the present have not been suitable for production by standard powder metallurgy techniques, are now being produced by this process.

Use of the infiltration method was foreseen in 1916 by C. L. Gebauer[1] of Cleveland, Ohio, who applied for patent rights in which he proposed a process whereby a mixture of finely powdered metals (or in colloidal form) could be molded into the desired size and shape under pressure. The compacted material was then subjected to a predetermined temperature, in a furnace, above the temperature of the lowest melting-point constituent which when molten, penetrated the pore volume of the compact. Freezing this constituent then caused an excellent brazed bonding of the non-melted phase. The product could then be pressed, stamped, rolled or worked into any desired simple shapes.

Further experiments by Gebauer[2] showed that a modification of this process of premixing the metal powders prior to sintering, was possible. He found that a powder compact of the desired size and shape could be pressed from the powder of the high melting metal and placed in a furnace, in close surface contact with sheets, plates or other solid forms of the low melting constituent. Heating to a temperature above the melting point of the low melting metal caused it to flow into the porous compact. In addition to the convenience gained by the ability to use each metal in the form in which it is most cheaply obtained commercially, there is the consideration that less of the low melting metal is effective, than when the powders are premixed.

[1] *U. S. Patent No.* 1,346,192 *dated July* 13, 1920.
[2] *U. S. Patent No.* 1,342,801 *dated June* 8, 1920.
[3] *U. S. Patent No.* 1,395,269 *dated Nov.* 1, 1921.
[4] *Kieffer & Hotop, Pulvermetallurgie und Sinterwerkstoffe, Berlin,* 1943, *p.* 206, 274.

BELOW

FIG. 1—Gear made by the infiltration process. The Cu-base slug shown alongside is placed into the bore of the gear and infiltrated by placing into furnace and melting the Cu alloy.

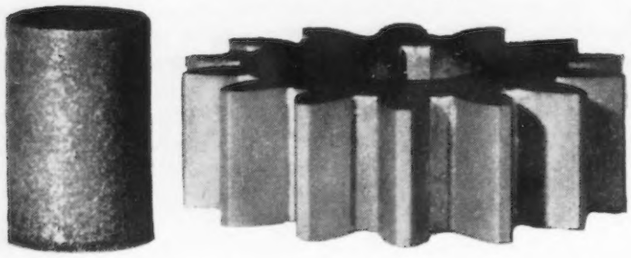

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FIG. 2—Iron: copper alloy, approximate ratio 2:1. Darker grains are ferrite; lighter network is copper alloy. Y.P. 24,000 psi; T.S. 46,000 psi; El. 32 pct; R.A. 33 pct; density 8.08 g/cc (98.8 pct of theoretical). Etched with picral. 750X.

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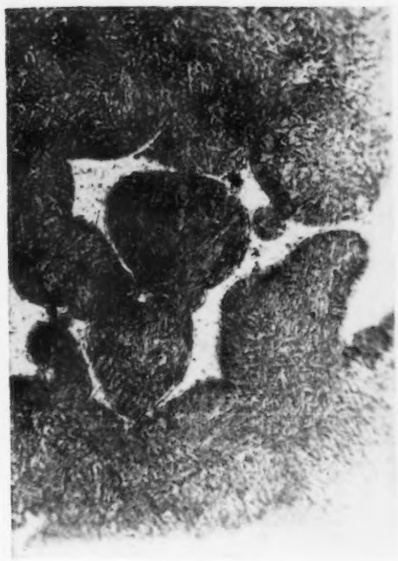

FIG. 3—Steel: copper alloy, approximate ratio 4:1. Dark areas are eutectoid steel; light fields are copper alloy. Y.P. 97,000 psi; T.S. 120,000 psi; El. 3 pct; R.A. 3 pct; density 7.90 (98.3 pct of theoretical). Etched with nital. 750X.

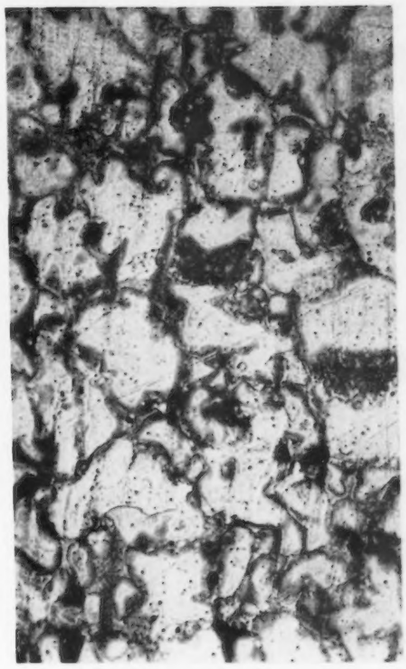

FIG. 4—Iron: copper alloy, ratio 4:1. Electrolytic iron powder, electrolytic copper powder, type O. Density 7.24 (density pct = 90.3 pct). Etched with picral. 200X.

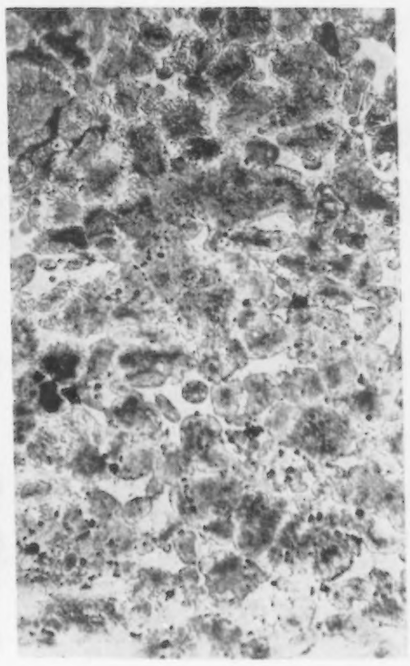

FIG. 5—Steel: copper alloy, infiltrated; ratio 4:1. Electrolytic iron powder, electrolytic copper powder, type O. Density 7.90 (density pct = 97.4 pct). Etched with picral. 100X.

Gebauer[3] also used a combination of tungsten and platinum for construction of contact points, with tungsten as the powdered "skeleton" and platinum as the brazing metal.

The technical development of Gebauer of infiltrating porous bodies of high melting metal with low melting metals (for example, the impregnation of iron bodies with copper and tungsten bodies with silver), was applied by H. Baumhauer in 1922 to include carbide skeleton bodies which were infiltrated with metals of the iron group. The structure of such infiltrated metals is not very different from that of sintered hard metals later on produced except that grain size is coarser, the infiltrated side of the carbide body is porous, and the distribution of the auxiliary cementing metal not quite uniform.[4]

One of the difficulties encountered in the early experiments was that a porous carbide skeleton is necessary when utilizing this process and the coarse powder particles which were available where much too coarse to give the desired surface for a cutting tool.

The iron-copper combination was found unsuccessful in the early days and was never utilized as an industrial process. Experiments conducted on a 50-50 mixture showed that the partial solubility of the two metals caused erosion effects (rough, porous surface). Further, the freezing of copper in the spacings between the iron particles resulted in an "icicling" effect, and the mechanical properties of the product were practically equivalent to the properties of cast copper. Kiefer and Hotop discuss the procedure whereby the iron skeleton is dipped into a nonferrous metal in liquid form so that infiltration of the latter may take place. American Electro Metal has duplicated a test described by P. Melchior,[4] wherein sintered iron bodies with a pore volume of 50 pct were infiltrated with Cu at 2000°F. The results obtained from the duplicated test conducted on 55 Fe:45 Cu (wtpct) material are as follows:

Density = 8.25 g per cc
Bhn = 88
Tensile Strength = 39,600 psi
Elongation = 32 pct
Izod impact = 14 ft-lb

Extensive tests conducted on various types of prod-

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FIG. 6—Steel: copper alloy (heat treated — quenched from 1500°F); ratio 4:1. Electrolytic iron powder, electrolytic copper powder, type O. Density 7.93 pct (density pct = 97.4 pct). Etched with picral. 200X.

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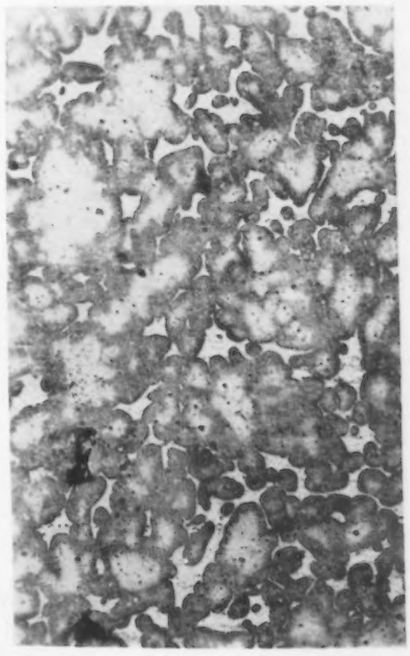

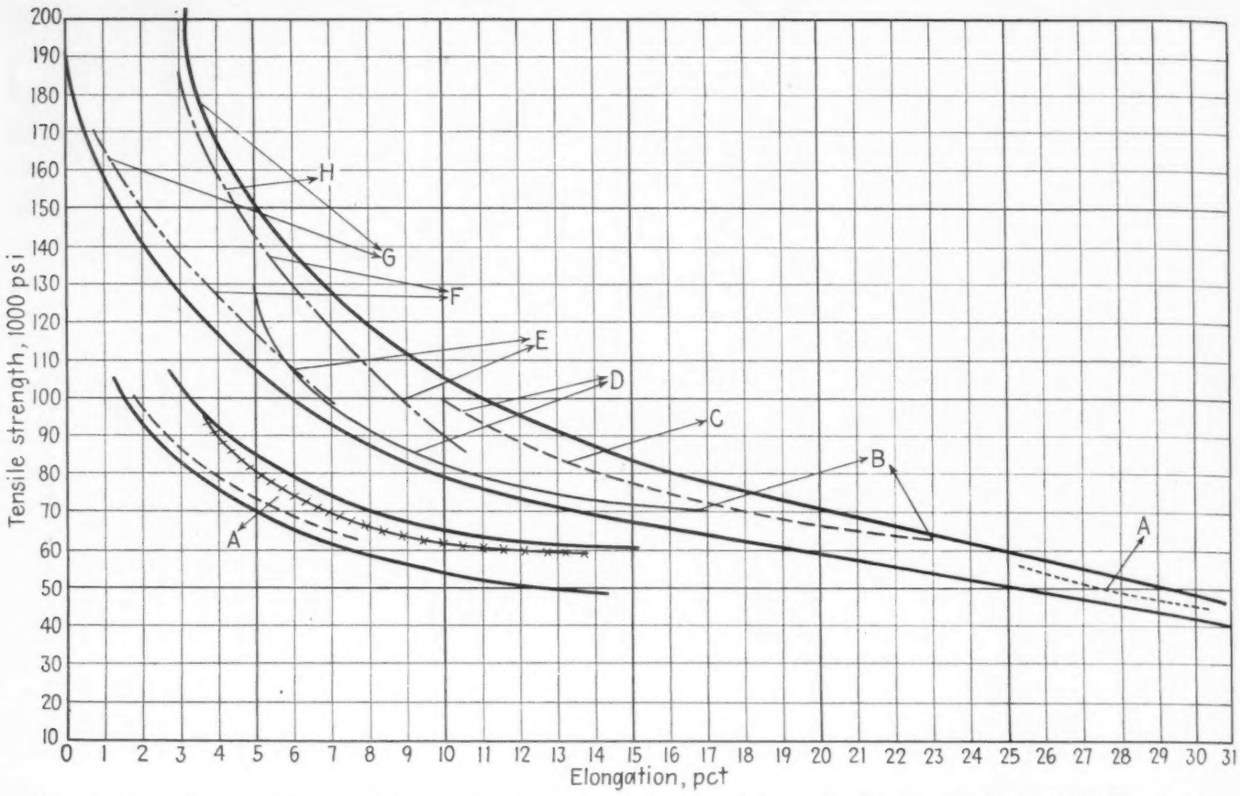

FIG. 7—Curves showing tensile strength v. elongation properties of Sinteel G before and after heat treatment. Properties of parts made by conventional powder metallurgy methods would fall below the range shown at curve A.

Key	Material	Carbon	Nonferrous	Density
– – – –	537*	none	Cu	
—·—	537	0.7	Cu	all
———	537	none	Cu-alloy	above
— — —	537	0.7	Cu-alloy	7.8
.....	Electr	none	Cu	
++++	Swedish	0.7	Cu	7.5–7.8
x–x–x–x–	Swedish	none	Cu	7.5–7.8

* A reduced sponge Fe powder.

HEAT TREATMENT

A	No Heat Treatment
B	1475°F, slow cool, 930°F for 4 hr.
C	1475°F, slow cool, 1550°F, H_2O quench.
D	1475°F, slow cool, 930°F to 1292°F for 2 hr.
E	1475°F, slow cool, 1200°F for 18 hr.
F	1475°F, slow cool, 1550°F, H_2O quench, 930°F for 2 hr.
G	1475°F, slow cool, 1550°F, H_2O quench, 600°F for 1 hr.
H	1475°F, slow cool, 1550°F, H_2O quench, 1100°F for 1 hr.

ucts produced by American Electro Metal Corp. (utilizing this process of infiltration of a low melting phase into a high melting phase powder (porous) skeleton) indicate that many of the early difficulties have now been overcome. Many metal combinations have been experimented with, and the company is currently in production of structural parts made from iron-copper and steel-copper combinations. It is satisfactory to use the cheapest iron powders commercially available —an economical asset to any process. When the powdered compact skeleton is to be composed of steel, this material too, is inexpensive, for several means of obtaining the powder are available—ground steel particles, decarburized cast iron, commercial iron powders, etc., any one of which can be used provided its particle size and shape is satisfactory.

The distribution of the metals varies from about 2/3 to 7/8 of the volume of the product as Fe, the remainder, a Cu-base alloy. The Fe volume is, of course, dependent on the porosity of the Fe compact,

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FIG. 8—Doughnut-shaped part, impractical to make under conventional powder metallurgy methods, but easily produced by infiltration method.

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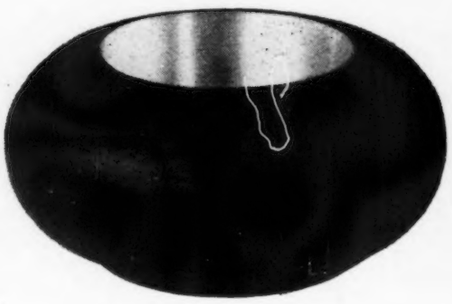

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FIG. 10 — Tensile specimen prepared from two brazed rods. Rupture of specimen in base metal rather than at the joint indicates high strength of the brazed bond.

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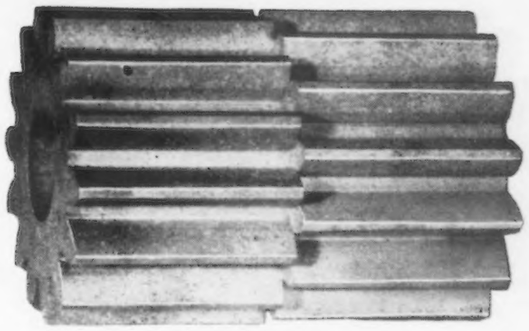

FIG. 9—Two gears, each made by infiltration method, brazed together by pressing parts together (held by fixture) and heated in furnace at temperature above the melting point of the Cu alloy.

which is controlled by the pressure used. For example, pressures vary from 8 to 50 tons per sq in. to obtain 2/3 to 7/8 Fe, respectively (for a 75 pct Fe product, the compact is produced under 25 tons per sq. in.), resulting in a skeleton of 70 to 90 pct density as compared with the finished product after infiltration.

The Fe powder compact skeleton, in close surface contact with the Cu-base material (for example, as shown in fig. 1, the Cu-base slug is placed in the bore of the gear), is placed into a furnace and held at a temperature above the melting point of the Cu material. Controlled atmospheres are used so as to prevent any surface oxidation which would impede close surface contact. The melted metal infiltrates into the porous Fe compact. Particle size and shape distribution of the Fe powder are closely controlled in order to provide a continuous channel of pores for the nonferrous material to flow throughout the mass. Evidence of the completeness of this infiltration is illustrated by the copper-colored surfaces of items produced as well as the lack of porosity shown in the photomicrographs, figs. 2, 3, 4, 5 and 6. Use of pure copper as the low melting phase causes erosion of the iron phase and poor surfaces due to the mutual partial solubility of Fe and Cu. The Cu-base alloy developed by American Electro Metal Corp. is insoluble in Fe, infiltrates as readily as Cu, and does not freeze with the icicling effect previously mentioned.

The remarkable mechanical properties obtained from this composite structure are shown in fig. 7. The curves cover a material called Sinteel* G, a ferrous metal made by powder metallurgy techniques and consisting of a steel matrix (bands cover variation from low to high carbon steel) cemented by Cu-base alloys. Tensile strengths of from 60,000 to 100,000 psi with corresponding elongation values of 10 to 4 pct and Izod impact, 8 to 4 ft-lb, can be improved to 60,000 to 185,000 psi tensile strength, 23 to 3 pct elongation and 14 to 6 ft-lb Izod impact, by suitable heat treatment.

One of the most encouraging prospects of the infiltration process is that parts, not necessarily of complicated shapes, but involving variations in cross-section such as the doughnut-shaped item shown in fig. 8 (and the gear, fig. 1) not only can be made by this

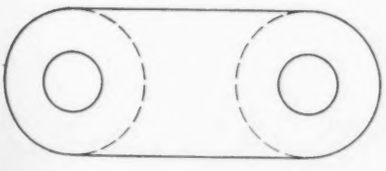

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FIG. 11 — Complicated part produced by brazing simple shapes together.

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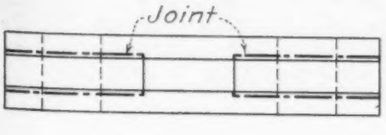

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FIG. 13 — Circular part produced by brazing simple shapes together.

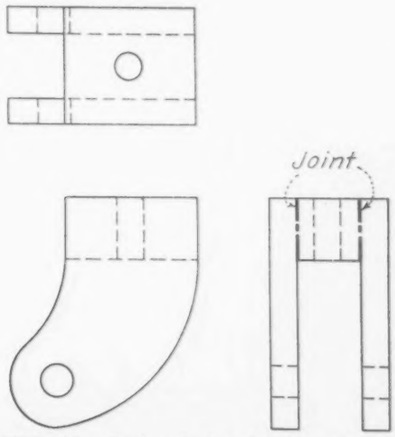
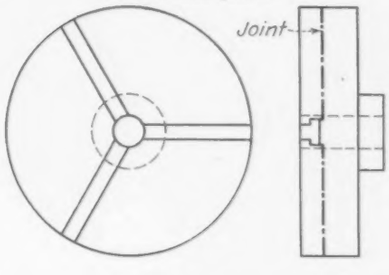


FIG. 12 — Produced by brazing simple shapes together. Heavy dotted lines indicate brazed joints.



method, but will have the same excellent density and physical properties as do simple shapes. To date, production has been limited to articles weighing from 4 oz to 20 lb.

In addition to the advantages of (1) cheap raw materials and (2) low compacting pressures (which makes possible larger size compacts), products made by this process can be readily surface treated and joined. The surface is sufficiently smooth and dense so that electroplating can be accomplished without infiltration of the plating solution. In view of the Cu present, the material can be readily brazed without the necessity of applying flux or brazing material. The photograph, fig. 9, is an example of a possible commercial application utilizing the brazing characteristics. The bond obtained between the two brazed gears is, as a rule, stronger than the basic parts. This is illustrated in fig. 10, which shows the point of rupture removed from the brazed joint. Further, the possibilities of producing complicated shapes (layouts of some contemplated parts are shown in figs. 11, 12 and 13) by this method are enhanced by the fact that many components can be joined by selfbrazing, simply by the application of heat to the parts to be joined, as by conventional furnace brazing.

* *Registered trade name of American Electro Metal Corp.*

Carburizing, nitriding and cyaniding offer no difficulties, since the copper can be removed to any desired depth by dipping the part in chromic acid prior to heat treatment. As a matter of fact, treatment for longer periods of time in the chromic acid produces an excellent bearing surface—the Cu is preferentially attacked, causing minute openings in the bearing surface to contain the lubricant.

Use of this process to produce parts made from alloy and stainless steel is currently under development by the American Electro Metal Corp. Preliminary tests show that powder compacts pressed from commercially available stainless or alloy steel powders or compacts made from the powdered alloy ingredients give excellent corrosion and wear resisting properties.

The possibilities resulting from this development are indeed emcouraging in that many of the limitations of powder metallurgy such as (1) availability of high pressures, (2) excessive die wear, (3) avoidance of wide variations in cross-section, (4) difficulty in making eccentric parts, (5) liberal tolerance requirements, (6) low mechanical properties and (7) porosity, are largely overcome by this new technique.

Carbon-Arc Welding for High-Strength Design

WELDING by the carbon-arc process offers certain advantages in the welding of aluminum alloys. In order to determine its suitability for high strength design, North American Aviation, Inc., conducted some interesting research into the subject. Tests were performed with 0.081-in. thick aluminum alloy 3S-O, with a 1/8-in. flange radius as shown in figs. 1 and 2, and it was found necessary to leave 1/16 in. excess material on the flange, as otherwise there would not be enough material present to produce the consistent weld desired.

The type of weld shown in fig. 1 was not satisfactory. The bead was high on the flanges, and there was not sufficient melted material between them. As shown in table I the joint efficiency was low, as also was the tensile strength. Increasing the bend radius to 5/16 in. raised both of these figures slightly, but not sufficiently to justify adoption of the method.

When the type of weld shown in fig. 2 was adopted, there was an immediate increase in joint efficiency and tensile strength, and while the table shows average values, a large number of welds were made in which the tensile strength per linear inch was 1000 lb. There is no doubt that if enough stock material is present, and with proper melting down, consistent values of over 1000 lb per linear inch can be maintained, which is considered satisfactory for high strength design.

The extra heat necessary to do a complete welding down keeps the metal molten long enough for the gases to escape, and porosity is kept to a minimum. Increased fatigue life can also be expected from this type of weld, as notch effect and bending moments in the weld are greatly reduced.

TABLE I

Summary of Tensile Strength

(Average Values)

Number	Material 0.081 in.	Tensile Strength, Lb. Per Linear In.	Tensile Strength, Psi	Bend Radius	Joint Efficiency,* Pct.
A	3S-O	537	6,530	1/8	41
B	3S-O	589	7,268	5/16	45.5
C	3S-O	929	11,338	1/8	71
D	3S-O	926	11,431	1/8	71.5

*—Based on typical values of 16,000 psi for 3S-O.

LEFT

FIG. 1—Small weld zone caused by insufficient melting results in low-strength joints.

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FIG. 2—Proper welding down produces a large fusion zone and gives joint efficiencies of 71 pct or more.

Design of Fixtures For Projection Welding

By MARIO L. OCHIEANO
Lockheed Aircraft Corp., Burbank, Calif.

IN the design of dies or fixtures for projection welding, there are several points to which particular attention must be paid if the fixtures are to operate successfully, since they differ in two main respects from those used for ordinary spotwelding. These differences are: (1) The dies must provide for a number of welds to be made simultaneously, and (2) the dies are electrified and form a part of the secondary current path. If the basic rules enumerated herein are adhered to, effective tooling can be designed which is both simple and inexpensive, and will permit economic application of the projection welding method.

The illustration, fig. 1, shows a projection weld die for welding a dowel pin assembly. It should be noted that all components of the die are insulated from the current-carrying copper alloy, and that no magnetic materials are used.

The first general rule to be observed in designing projection welding dies is that no magnetic material can be permitted inside the area surrounded by the upper and lower arms, the welding dies, and the transformer housing. The presence of magnetic materials in this area (commonly referred to as the throat or loop) introduces a choking effect on the welding current, thus decreasing the efficiency of the machine. Secondly, all plugs or contact faces should be easily and quickly replacable, and should be water cooled as close to the ends as possible. By this means, parts subject to considerable wear can be replaced and much longer die life can be obtained. In the die shown in fig. 1, the items (2) and (4) are replacable individually.

Another point to be watched is that all pins, clamps, locators, and index pins should be insulated from current carrying units. An example of this is shown in the sketch, fig. 2. Dielectric material such as fiber, micarta, vulcoid, and bakelite may be used to fabricate such parts, thereby eliminating the insulating requirement, but the choice as to whether a metallic or nonmetallic substance is used must be governed by the service to be rendered. Generally, for long production runs or where high abrasion resistance is required, it is more economical to use a metallic material to satisfactorily withstand wear and avoid frequent replacement. On limited production runs, or where such parts receive relatively light usage, nonmetallic materials are quite satisfactory.

Fig. 3 shows a recommended design for projection

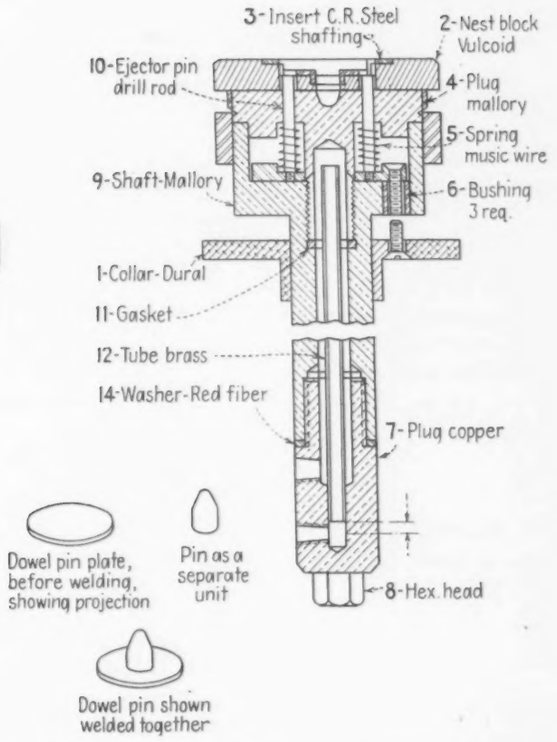


FIG. 1—Typical die used for projection welding of the components shown at lower left.

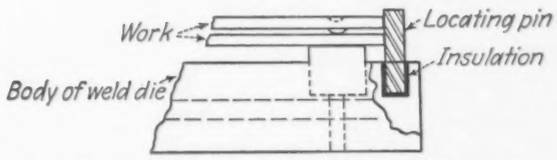


FIG. 2—All pins, clamps, and locators should be carefully insulated from current carrying units.

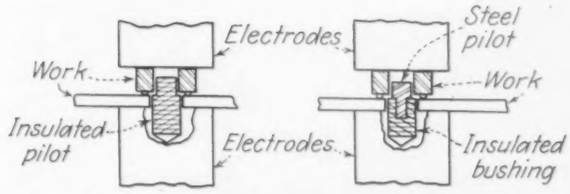


FIG. 3—Two possible arrangements of metallic and nonmetallic pilots for projection welding of nuts in high or low production.

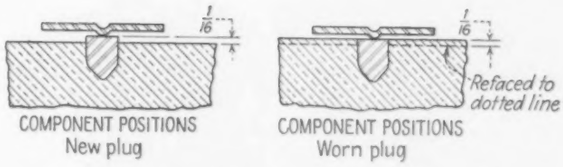


FIG. 4—Parts subject to wear should be designed to allow proper clearance in both worn and unworn positions, and, if possible, to permit several refacings.

welding nuts and similar parts with drilled or tapped holes. At the left is shown an arrangement using a solid pilot of insulating material for short runs. At the right, fig. 3, a steel pilot is inserted in an insulating bushing to provide longer wear life for high production.

Consideration must be given, and provision made for electrode or die wear when designing stops, gage points, and pins, or when nesting components in the copper electrode or die, so as to assure a large enough surface to properly locate or nest the work at both new and worn electrode heights. As shown in fig. 4, the plug, which is detail (4) in fig. 1, was designed to allow 1/16-in. wear, and it was found that approximately 50,000 parts could be welded before resurfacing was necessary. The die design was such that this refacing operation could be carried out four times before complete replacement of the plug was necessary. Another point to be watched is that all movable sections such as adjusting screws, index pins, slides, bearings, and any accurate locating device should be protected against flash.

Ease of loading and unloading the dies should also receive consideration, and care must be taken that the die unloads properly after the parts are welded. On hand-loaded dies, some safety measure should be provided to protect the operator's hands. Ejector pins, operated through a leverage coupled with air knockouts or mechanical strippers, save considerable time and add to the operator's protection.

Automatic Perforating Press

RECENTLY announced by E. W. Bliss Co., is a completely new design of perforating press built at their Toledo plant. With a capacity of 75 tons, the machine was designed for fine perforating operations requiring precision dies and extreme accuracy in the feeding mechanism.

Very massively constructed, the press employs a full eccentric type crankshaft. The clutch is air operated of the disk type with integral brake disks and will stop the press automatically and quickly when the air valve is shut off. Under normal operating conditions, the clutch is operated only occasionally to stop and start the machine for each sheet inserted. A substantial guard covers the flywheel, V belts and the clutch to give full protection from the moving parts.

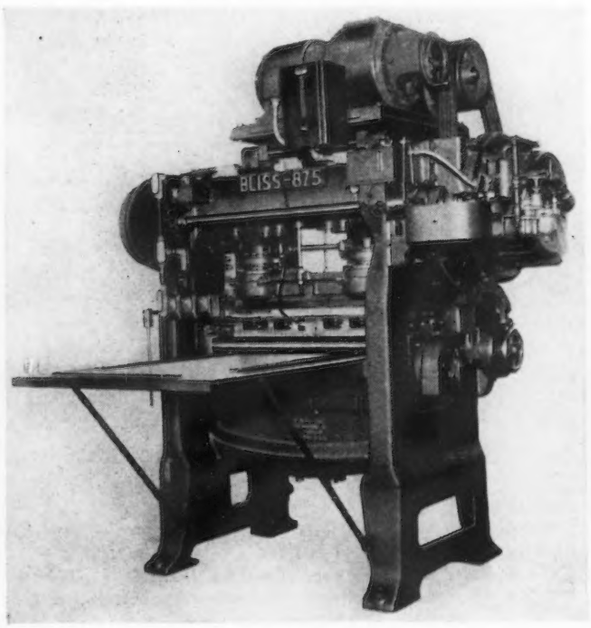
The feeding mechanism is operated through a removable ratchet on the right hand side of the press. The ratchet is entirely enclosed yet it can be easily removed in a few minutes. The standard ratchet furnished with the machine provides for a minimum feed unit of 1/64 in. corresponding to 1 tooth feed of the ratchet. By adjusting the feed crank for 1, 2, 3, etc., a feed of respectively 1/64 in., 1/32 in., 3/64 in., etc., up to a maximum of 5/8 in. is readily obtainable. In case that in-between sizes of feeds are required, special ratchets can be furnished for a minimum feed as low as 0.010 in.

For die setting and testing, the inch button gives minute control of the slide movement. The press is equipped with an automatic electrically operated stopping device which will stop the press before the tail edge of the sheet reaches the punching line, leaving a safe margin between the last row of holes and the edge of the sheet. This prevents the punches from hitting half and half on the edge of the sheet, thereby safeguarding against the breakage of small fragile punches.

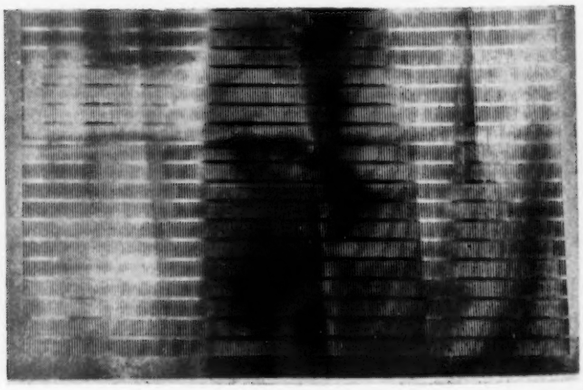
The operating sequence is as follows: The operator separates the feed rolls by releasing the handle, and inserts the sheet between the side gages and draws the edge of the sheet up against the back gage properly adjusted so that the front edge of the sheet is safely beyond the line of the punches with proper margin.

The feed rolls are lowered and the run button depressed. As the operation proceeds, a safety device is arranged to stop the press before the punches reach the edge of the sheet to prevent the punches from breaking. The feed rolls are released and the sheet removed and a new sheet inserted.

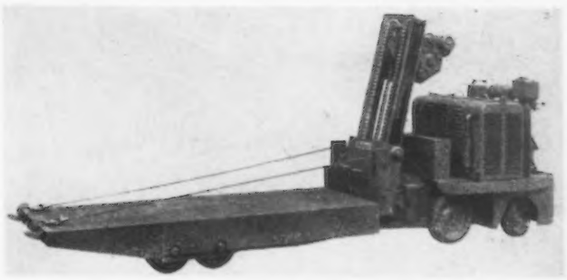
SPECIALLY designed for fast, automatic operation, this Bliss perforating press will deliver 180 to 360 strokes per min, and has a capacity of 75 tons.



A SAMPLE of the fine, closely spaced perforations that can be punched out on the new Bliss press.



Sheet Steel Handling Simplified



MANUFACTURED by Baker Industrial Truck Div. of Baker-Raulang Co., this new style truck will handle 10 ton packages of steel sheets in and out of box cars at a rate of 3 min per pack for loading and 5 min for unloading.

o o o

LOADING and unloading of steel sheets in and out of boxcars has always been a problem to the steel industry. Sheets have had to be handled singly, or three or four at a time, by hand, a costly and lengthy process frequently resulting in scratching the full finish sheets used for automobile work.

Blocking the bundles of sheets in the car has required approximately $10 dunnage and about the same amount of labor, or a total expense of $20 or more per car. Even though these packs were blocked very carefully, they often broke loose during switching in the railroad yards, which sometimes resulted in their breaking through the ends of the cars, to say nothing of a considerable damage to the sheets themselves.

In the past few years, a number of improvements have been made in shipping sheet steel to avoid much of this damage. One of the most important innovations was the tying together of the sheets in unit packages. These packages were allowed to slide freely on the car floor, the impact being taken up by the friction between the pack and the floor. The sheets were tied together with wire, steel strapping, or with angle iron and threaded rods. Of these, the strapping has proved to be the most satisfactory and the angle iron and rods, the least practical.

Shipping sheets in packages has eliminated much of the expense of the dunnage and bracing as well as damage to the cars and sheet in transit; but it has still been necessary to place the sheets on the pile in the car one at a time before strapping the package together. At the destination, the straps must be broken and the sheets unloaded by the same long, expensive process with considerable damage to the sheets by scratching.

A great many different methods have been tried for placing the entire bound package in the car, but for various reasons they have proved universally unsuccessful. One such system used a 10-ton elevating truck and a special portable crane. The crane, of the straddle type, is set up in the car and the elevating truck then brings in the package and runs between the legs of the crane with it. The crane hoist picks up the package from the truck platform and, after the truck has backed out, places it on the floor of the car. This method of handling is slow, because of the time required to move and set up the crane, and it is limited to sheets of about 72-in. length, as this is the maximum that the elevating truck can carry through a boxcar door. Also, if a 7½-ton or full 10-ton pack is attempted, the truck wheels are likely to break through the car floor.

As a result of the difficulties encountered in placing the large packs in a boxcar, many mills have tried to ship in gondola cars which can be loaded by an overhead crane. This system has made it necessary to add to the cost of loading about $8 or $10 for waterproof coverings for the sheets. In spite of these precautions, some loss has always been found from rusting and the unloading operation is extremely difficult in winter when the packages are frozen to the car floor.

Engineers of the Baker Industrial Truck Div. of Baker-Raulang Co. worked on this problem for over a year in cooperation with a major producer before a successful machine and method of handling were finally worked out. The result was a truck which will place a 10-ton package of sheet in the corner of a boxcar, handling packs up to a maximum of 48 x 120 in. through a car door 6 ft wide, and will do it without breaking through the car floor. The truck is equally capable of removing these 10-ton packages from the car, the only requirement being that they must be securely strapped to a pair of 2 x 4-in. wood stringers.

Designated as Baker's Type AM, the truck consists of two articulated sections. The power section carries the battery and the driving and steering mechanisms. The load section consists of a tilting platform mounted on a single non-steerable axle and includes a hoist for tilting the platform, and a double-drum winch unit. In operation, the truck is very much like a one-horse wagon with the cart before the horse. This method of steering with the articulated frame enables it to go through a narrow door with a long package and to place it in the desired location, or to pick up a pack from any position and remove it from the car.

The standard truck has a tilting platform 83 in. long and was developed for handling sheets up to 48 x 96 in., but has been used successfully to handle sheets up to 102 in. long. A larger size of truck will handle packages up to 144 in. long but requires automobile cars with wide doors.

In using the Baker sheet handler, it will normally be found most practical for the truck to receive its load in the shipping room where the packages are strapped together, usually being loaded by the overhead crane at the scales. Similarly, in unloading, the truck would take its load from the car to the warehouse. However, for purposes of comparison with hand labor, these figures are based on the truck's receiving its load on the dock and carrying it into the car, or bringing the load from the car to the dock. On such a basis, it will load approximately 2000 tons of sheet in a 10-hr day, handling a 10-ton package from the dock to the car in 3 min. When unloading, the truck will handle a package from the car to the dock every 5 min, having a capacity of 1200 tons per day. Under these conditions, the unloading cost is about 2¢ per ton and the loading cost even lower.

Foundrymen to Mark 50

Commemorating its founding in 1896, the American Foundrymen's Association has developed a program of unusual scope and interest for its Golden Jubilee Convention and Exposition to be held in Cleveland, May 6th to 10th. Supporting the meeting's theme of "better castings at lower production cost," the equipment exhibition will present for the first time many new and improved types of equipment and material.

COMMEMORATING 50 years of service to the foundry industry, the American Foundrymen's Assn. has designated its coming annual meeting as its "Golden Jubilee" convention and exposition. Scheduled for the week of May 6 to 10 in Cleveland, the meeting is expected to attract 10,000 foundrymen from all parts of this country and a dozen foreign nations.

Planned to assist foundrymen to fit together wartime developments and to chart realistic programs for increased output, the anniversary congress has established as its theme—"Better castings at lower production costs." In keeping with this theme, the technical program has been arranged to provide the most modern information available on such problems as quality control, plant modernization, improved shop practices, better understanding and full utilization of the engineering properties of cast metals, cost accounting and job training.

The equipment and material exhibit, being held in conjunction with the technical meetings, will be the largest ever staged by the association and will represent the first public showing of many new and improved types of machines, instruments, control systems and other devices developed to speed and improve casting production during the war years. The material and equipment exhibition will be housed in the Cleveland Public Auditorium.

Some 150 papers and addresses, panels and round table talks on subjects ranging from accident prevention to Washburn risers and from inoculation to veteran training are scheduled for the 60 technical sessions of the congress. Climax of the convention program will be the annual AFA dinner on May 10, featuring an address by Brig. Gen. Donald Armstrong, commandant, Army Industrial College, Washington, on "Foundry Industry in War and Peace," and presentation of AFA gold medals and honorary membership awards.

Peter Blackwood, Ford Motor Co. of Canada, Ltd., will receive the John H. Whiting Gold Medal for his "development work on centrifugal castings and his influence on the free interchange of research data." Hyman Bornstein, director of testing and research laboratories, Deere & Co., Moline, Ill., an AFA past president, will be awarded the association's William H. McFadden Gold Medal for his "many and outstanding technological contributions to the foundry industry, particularly in the field of gray cast iron."

Years of Progress . . .

FRED J. WALLS, metallurgist, International Nickel Co., and AFA president.

The association's newest award, the Peter L. Simpson Memorial Gold Medal, will go to Howard F. Taylor, formerly of the Naval Research Laboratory, Washington, now research associate at Massachusetts Institute of Technology, for his "unfailing interest in and contributions to foundry research, and for his influence on the broadening of naval research in the field of cast metals." William J. Coane, vice-president, Ajax Metal Co., Philadelphia, and Harold J. Roast, vice-president, Canadian Bronze Co., Ltd., Montreal, will receive honorary life memberships.

Fred J. Walls, International Nickel Co., Inc., Detroit, and president of AFA, will deliver the president's annual address at the association's 50th annual business meeting, scheduled for May 9. The 1946 AFA Foundation Lecture, to be presented by Dr. Guilliam H. Clamer, president, Ajax Metal Co., Philadelphia, and AFA gold medalist and past president, will be delivered following the annual business meeting.

Nominated to succeed Mr. Walls as AFA president is Sheldon V. Wood, president and general manager, Minneapolis Electric Steel Castings Co., Minneapolis. Max Kuniansky, vice-president and general manager, Lynchburg Foundry Co., Lynchburg, Va., is the nominee for vice-president. Directors nominated for three-year terms are Horace A. Deane, vice-president in charge of operations, Brake Shoe and Castings Div., American Brake Shoe Co., New York; Stowell C. Wasson, manager, National Malleable & Steel Castings Co., Chicago; Bruce L. Simpson, president, National Engineering Co., Chicago; J. E. Kolb, pattern shop superintendent, Caterpillar Tractor Co., Peoria, Ill., and H. G. Lamker, superintendent of foundries, Wright Aeronautical Corp., Paterson, N. J.

General management interest sessions of the five-day congress will cover such topics as accident prevention, mechanical shakeouts, dust control, maintenance, inspection, apprentice, veteran and foreman training, cost systems, job evaluation and time study, upgrading, engineering school contacts and educational work.

The AFA gray iron division, headed by T. E. Eagan, chief metallurgist, Cooper-Bessemer Corp., Grove City, Pa., is sponsoring a two-session engineering properties symposium for design engineers; three technical sessions, including one on welding, and four shop course sessions. The engineering properties symposium will cover the chemistry and physical and mechanical properties of plain and alloyed gray irons, touch upon existing specifications, and discuss wear resistance, ductility and elasticity, effect of section size on tensile properties and the relationship between tensile tests and actual rupture stresses.

Other gray iron sessions will consider cupola operation and control, microstructure in relation to properties, heat treatment effects on endurance limit, engineering properties of heat treated irons, and the physical and metallurgical aspects of repair welding. Gray iron shop course sessions will discuss the metallurgy of cupola mixes, castings defects attributable to metal and the metallurgy of carbon control in the cupola.

Steel division sessions, under the general chairmanship of C. H. Lorig, Battelle Memorial Institute, Columbus, will include discussions by two Russian technicians and an Institute of British Foundrymen exchange paper. Among other topics to be covered are bore cracks in cast steel valves and fittings, homogenization heat treatment, thermal relief of stresses, steel foundry practices, methods of quality control, conventional and Washburn risers and low temperature properties.

Sessions of the aluminum-magnesium division, headed by R. E. Ward, chief metallurgical engineer, Eclipse Pioneer Div., Bendix Aviation Corp., Bendix, N. J., will include committee reports on die and permanent mold castings, unsoundness in cast light alloys and dimensional stability of aluminum castings, and papers on microporosity, mold material effects, centrifugal casting and heat treating. A lecture course session will discuss "Aluminum and Magnesium Foundry Control" and magnesium sand control is to be the topic of the first of the sand shop course sessions.

Sessions scheduled by the brass and bronze division, of which D. Frank O'Connor, foundry superintendent, American Saw Mill Machinery Co., Hackettstown, N. J., is chairman, will feature a committee report on manganese bronze and an Australian exchange paper. Also scheduled are such subjects as correct combustion for crucible melting, conditions of flow in bronze castings, knock-off risers, use of insulating pads and riser sleeves, sealing bronze pressure castings through heat treatment, and the distribution of mechanical properties in sand cast bronzes.

Malleable iron sessions will cover coremaking practices, chemical composition, atmosphere indicators, single and double burner use in melting, sulfur-manganese ratios, and the use of large end test bars.

An "Information Please" panel and five papers comprise the sessions on refractories and a panel on "Suppliers' and Buyers' Viewpoints of Inspection in the Foundry," along with three papers, including one on non-destructive testing, will feature the program of the castings inspection committee.

A foundry instructors' dinner meeting, a session on

foreman training, a panel on "College Graduates v. Employers" and three sessions devoted to apprentice training have been set up by the various committees concerned with the industrial training and engineering school phases of the association's educational work.

The job evaluation and time study committee of AFA has arranged two sessions: "What Management Should Know About Time Study," and a round table discussion of time study practices. The complete technical program follows.

Program of AFA Golden Jubilee Congress

MONDAY, MAY 6

9:00 A.M.
Registration Begins.

12:00 P.M.
Aluminum and Magnesium Round Table Luncheon.

Presiding—R. E. Ward, Eclipse Pioneer Div., Bendix Aviation Corp., Bendix, N. J.

Co-Chairman—A. T. Ruppe, Bendix Products Corp., South Bend, Ind.

"Report of Committee on Recommended Practices for Aluminum and Magnesium Die Castings"—by J. C. Fox, Doehler-Jarvis Corp., New York, and *"Report of Committee on Recommended Practices for Aluminum and Magnesium Permanent Mold Castings"*—by A. Sugar, American Metal Co. Ltd., New York.

2:00 P.M.
Plant Equipment, Safety and Hygiene.

Presiding — James Thomson, Continental Foundry & Machine Co., East Chicago, Ind.

Co-Chairman — C. P. Guion, W. W. Sly Mfg. Co., Chicago.

"Accident Prevention as a Function of Management"—by R. R. Meigs, Liberty Mutual Insurance Co., Boston, and *"Mechanical Shakeouts"*—by J. L. Yates, Worthington Pump & Machinery Corp., Buffalo.

4:00 P.M.
Lecture Course (Session 1).

Presiding — D. Basch, Almin Co., Schenectady.

Co-Chairman—H. Brown, Aluminum Industries, Inc., Cincinnati.

Subject—*"Aluminum and Magnesium Foundry Control."*

Discussion Leader — Oscar Blohm, Hills-McCanna Co., Chicago.

Gray Iron Shop Course (Session 1)

Presiding—George A. Timmons, Climax Molybdenum Co., Detroit.

Co-Chairman—P. T. Bancroft, Republic Coal & Coke Co., Moline, Ill.

Subject — *"Metallurgy of Cupola Mixes."*

Discussion Leader—K. H. Priestley, Eaton Mfg. Co., Vassar, Mich.

8:00 P.M.
Sand Shop Course (Session 1).

Presiding — F. S. Brewster, Dow Chemical Co., Bay City, Mich.

Subject — *"Magnesium Molding Sands."*

Discussion Leader — Oscar Blohm, Hills-McCanna Co., Chicago.

Plant Equipment, Safety and Hygiene.

Presiding — James Thomson, Continental Foundry & Machine Co., East Chicago.

Co-Chairman — W. O. Vedder, Pangborn Corp., Hagerstown, Md.

"Exhaust Hoods and Piping Systems"—by E. A. Carsey, Kirk & Blum Mfg. Co., Cincinnati; *"Centrifugal Collectors"*—by H. C. Dohrmann, Buell Engineering Co., New York; *"Cloth Collectors"*—by G. A. Boesger, W.

50 Years Ago

Fifty years ago, in May 1896, to be exact, a group of far-seeing foundrymen met in Philadelphia to take the final formal steps toward the forming of the American Foundrymen's Assn. The year 1896 was an uncertain one for foundrymen and businessmen in general. Exponents of free silver were pushing their aims aggressively; the general uncertainty over the government's monetary policies was being reflected in a slowing down of industrial activity.

Andrew Carnegie lashed out at those proposing the devaluation of the gold dollar saying "Honest men are being driven out of business; it is fast coming into the hands of scoundrels who will swear to anything. . ."

It was that year that Carnegie and Bethlehem were awarded contracts for armor plate for the battleships Kearsarge and Kentucky at $552 a ton. Stove plate was selling at $7 a ton. . . . Chicago structural steel workers went on strike demanding 45¢ an hr, but settled later for 41¼¢ . . . Philadelphia foundrymen were urging the election of McKinley and southern silvery iron was quoted at $12.35 a ton. The Erie Specialty Co. was proudly telling the hardware trade in the pages of THE IRON AGE of its newest product—an ornate cork puller, nicely decorated, nickel plated and featuring an attached wire cutter. Another choice item was a family nutmeg grinder.

The master mechanic of the Pennsylvania Railroad was predicting electrification of the road's lines in 5 yr, and promised schedules of 60 mph. That was 50 yr ago. And despite the uncertainties and confusion of the passing years, the AFA has developed steadily from that humble beginning to what is now acknowledged to be one of the nation's outstanding technical associations.

This year's annual convention and exhibition is a fitting commemorative to the foresight of these early pioneers, whose names are still bywords in the foundry. The association still has much ahead of it, not alone within the industry, but also in the field of the public's education to a better understanding of the industry.

W. Sly Mfg. Co., Cleveland; *"Web Collectors"*—by A. S. Lundy, Claude B. Schneible Co., Detroit; *"Fans and Exhausters"*—by Phillip Cohen, B. F. Sturtevant Co., Cleveland, and *"Maintenance"* — by K. M. Smith, Caterpillar Tractor Co., Peoria, Ill.

Aluminum and Magnesium.

Presiding—Leslie Brown, Magnesium Fabricators Div., Bohn Aluminum & Brass Corp., Adrian, Mich.

Co-Chairman—G. G. Glider, Ebaloy Foundries, Inc., Rockford, Ill.

"Interrelation of Various Major Factors Determining the Amount of Microporosity in Magnesium Alloy Castings"—by L. W. Eastwood and J. A. Davis, Battelle Memorial Institute, Columbus; *"Effect of Mold Materials and Practices on the Quality of Magnesium Alloy Castings"*—by M. V. Chamberlin and J. G. Mezoff, Dow Chemical Co., Midland, Mich., and *"Centrifugal Casting of a Magnesium Part"*—by F. P. Strieter and R. J. Maenner, Dow Chemical Co., Midland, Mich.

TUESDAY, MAY 7

10:00 A.M.

Malleable Foundry Practice.

Presiding — A. M. Fulton, Northern Malleable Iron Co., St. Paul.

Co-Chairman—C. F. Joseph, Saginaw Malleable Iron Div., General Motors Corp., Saginaw, Mich.

"Chemical Composition of Malleable Iron"—by H. A. Schwartz, National Malleable & Steel Castings Co., Cleveland and *"Cores for Automotive Malleable Iron Castings"*—by W. G. Ferrell, Auto Specialties Mfg. Co., St. Joseph, Mich.; *"Heat Treating Furnaces in Foundry Work"*—by V. Paschkis, Columbia University, New York.

Aluminum and Magnesium Session.

Presiding—Walter Bonsack, National Smelting Co., Cleveland.

Co-Chairman—L. W. Eastwood, Battelle Memorial Institute, Columbus, Ohio.

"Heat Treatment of Aluminum Alloy Castings"—by Walter E. Sicha and H. J. Rowe, Aluminum Co. of America, Pittsburgh; *"The Effect of Certain Elements on Some Properties of an Aluminum Sand Casting Alloy"*—by R. A. Quadt, American Smelting & Refining Co., Barber, N. J.; *"Characteristics of Aluminum Casting Alloy 3 pct Silicon—5 pct Copper"*—by O. Tichy, National Smelting Co., Cleveland.

Inspection of Castings.

Presiding—Harold W. Warner, Allis-Chalmers Mfg. Co., Milwaukee.

SHELDON V. WOOD, president and general manager, Minneapolis Electric Steel Casting Co., nominated for the presidency of AFA.

Co-Chairman—E. G. Leverenz, American Steel Foundries, East Chicago, Ind.

"Duties and Functions of the Inspection Dept., As Seen by Management"—by M. D. Johnson, Purolator Products, Inc., Newark; *"Inspection—The Backbone of Quality Control"* — by W. H. Gunselman, Samuel Greenfield Co., Inc., Buffalo; *"Non-Destructive Inspection of Castings"*—by C. L. Frear and R. E. Lyons, Bureau of Ships, U. S. Navy Dept., Washington.

12:00 P.M.

Luncheon—Engineering School Alumni Groups.

Presiding—F. G. Sefing, International Nickel Co., New York.

Canadian Members' Luncheon.

Presiding — J. Sully, Sully Brass Foundry, Toronto.

2:00 P.M.

Inspection of Castings.

Presiding—E. F. Platt, Sperry Gyroscope Co., Brooklyn.

Co-Chairman — W. H. Gunselman, Samuel Greenfield Co., Inc., Buffalo.

Panel Discussion: *"Suppliers' and Buyers' Viewpoint of Inspection in the Foundry."*

Discussion Leaders — C. H. Thomas, Chicago & Northwestern R. R., Chicago; W. Klayer, Aluminum Industries, Inc., Cincinnati; John Amoroso, Sterling Engine Co., Buffalo; G. Dewald, Ampco Metals, Inc., Milwaukee; H. Wallace, American Steel Foundries, Verona, Pa.

Refractories.

Presiding—C. E. Bales, Ironton Fire Brick Co., Ironton, Ohio.

Co-Chairman — C. S. Reed, Chicago Retort & Fire Brick Co., Chicago.

"Suggested Cupola Refractory Standardization"—by R. P. Stevens, Chicago Retort & Fire Brick Co., Chicago; *"Foundry Refractories — Their Properties and Application"* —by C. A. Brashares, Harbison-Walker Refractories Co., Pittsburgh; *"Refractories in Non-Ferrous Practice"* — by H. R. Kohl, General Electric Co., Erie, Pa.; *"The Use of Rammed Refractories in Electric Steel Foundries"* — by R. H. Zoller, Zoller Castings Co., Bettsville, Ohio.

Malleable Foundry Practice.

Presiding—R. J. Anderson, Belle City Malleable Iron Co., Racine, Wis.

Co-Chairman—D. I. Dobson, General Malleable Corp., Waukesha, Wis.

"Malleable Foundry Core Making Practice for Pipe Fittings and Small Castings"—by D. F. Sawtelle, Malleable Iron Fittings Co., Branford, Conn.; *"Core Sand Practice and Control in a Mechanized Malleable Iron Foundry"* — by Joseph J. Clark, Saginaw Malleable Iron Div., General Motors Corp., Saginaw, Mich.

4:00 P.M.

Aluminum and Magnesium.

Presiding — W. E. Martin, National Smelting Co., Cleveland.

Co-Chairman — A. W. Stolzenburg, Aluminum Co. of America, Detroit.

Committee Report: *"Unsoundness in Cast Light Alloys"*—by L. W. Eastwood, Battelle Memorial Institute, Columbus, Ohio. (A.F.A. Committee on Shrinkage and Porosity.); *"Report of Committee on Dimensional Stability of Aluminum Castings"*—by H. Brown, Aluminum Industries, Inc., Cincinnati; *"Relation of Design and Metallurgical Factors to Serviceability of Magnesium Castings"*—by G. H. Found, Dow Chemical Co., Bay City, Mich.

Gray Iron Shop Course (Session 2)

Presiding — W. A. Hambley, Allis-Chalmers Mfg. Co., Milwaukee.

Co-Chairman—George W. Anselman, Goebig Mineral Supply Co., Chicago.

"Casting Defects Attributable to

Metal" — A.F.A. Committee on Analysis of Castings Defects.

Lecture Course (Session 2)—Malleable Iron.

Presiding—W. B. McFerrin, Electro Metallurgical Co., Detroit.

Co-Chairman—W. D. McMillan, International Harvester Co., McCormick Works, Chicago.

"Malleable Foundry Control"—by C. F. Joseph, Saginaw Malleable Iron Div., General Motors Corp., Saginaw, Mich.

7:00 P.M.

Chapter Officers and Directors Dinner.

Presiding—S. V. Wood, Minneapolis Electric Steel Castings Co., Minneapolis.

8:00 P.M.

Refractories.

Presiding—C. E. Bales, Ironton Fire Brick Co., Ironton, Ohio.

Co-Chairman — C. S. Reed, Chicago Retort & Fire Brick Co., Chicago.

"Lining and Patching of Cupolas"—by E. J. Lally, Jr., Forest City Foundries Co., Cleveland; *"Information Please"* on Foundry Refractories—Question and answer panel.

Moderator—C. S. Reed, Chicago Retort & Fire Brick Co., Chicago. Panel Leaders: R. H. Stone, Vesuvius Crucible Co., Swissvale, Pa.; J. A. Bowers, American Cast Iron Pipe Co., Birmingham; E. J. Carmody, Chas. C. Kawin Co., Chicago; A. S. Klopf, Lester B. Knight & Associates, Chicago.

Sand Shop Course (Session 2).

Presiding—D. F. Sawtelle, Malleable Iron Fittings Co., Branford, Conn.

Subject — *"Malleable Molding Sand Control."* Discussion Leaders: E. C. Zirzow, National Malleable & Steel Castings Co., Cleveland; L. R. Spann, Eastern Malleable Iron Co., Naugatuck, Conn.

WEDNESDAY, MAY 8

10:00 A.M.

Malleable Foundry Practice.

Presiding—W. D. McMillan, Internationall Harvester Co., Chicago.

Co-Chairman—D. F. Sawtelle, Malleable Iron Fittings Co., Branford, Conn.

"Core Practice in an Agricultural Malleable Foundry"—by E. Welander, Union Malleable Iron Works, East Moline, Ill.; *"Malleable Core Making Practice"*—by E. C. Zirzow, National Malleable & Steel Castings Co., Cleveland.

Brass and Bronze.

Presiding — D. Frank O'Connor, American Saw Mill Machine Co., Hackettstown, N. J.

Co-Chairman—Herman Smith, Federated Metals Div., American Smelting & Refining Co., Pittsburgh.

"Observations on Gas Elimination in Non-Ferrous Alloy Castings"—by George Dalbey, U. S. Navy Yard, Mare Island, Calif.; *"Correct Combustion for Crucible Furnace Melting"*—by A. C. Schmid, Jos. Dixon Crucible Co., Jersey City; *"Conditions of Flow in Bronze Castings"* —by Lt. J. T. Robertson and R. G. Hardy, Naval Research Laboratory, Washington.

Sand Research.

Presiding—H. F. Taylor, Massachusetts Institute of Technology, Cambridge, Mass.

Co-Chairman — J. A. Rassenfoss, American Steel Foundries, Indiana Harbor, Ind.

"Sixth Annual Report of Committee on Physical Properties of Foundry Sands at Elevated Temperature"—by D. C. Williams, A.F.A. Research Fellow, Cornell University, Ithaca, N. Y.; *"Heat Absorption of Sand"* —by H. W. Dietert and R. L. Doelman, Harry W. Dietert Co., Detroit; *"A Contribution to the Theory of Binders of Molding Sand"*—by L. Jenicek, Prague, Czechoslovakia.

Symposium on Engineering Properties of Gray Iron.

Presiding—R. G. McElwee, Vanadium Corp. of America, Detroit.

Co-Chairman—W. E. Mahin, Armour Research Foundation, Illinois Institute of Technology, Chicago.

"Engineering Properties of Gray Iron"—by W. E. Mahin, Armour Research Foundation, Illinois Institute of Technology, Chicago.

12:00 P.M.

Brass and Bronze Round Table Luncheon.

Presiding — B. A. Miller, Baldwin Locomotive Works, Cramp Brass & Iron Foundries Div., Philadelphia.

Co-Chairman—C. Louis Lane, Florence Pipe Foundry & Machine Co., Florence, N. J.

"Synthetic Versus Natural Sands"—by M. T. Ganzauge, General Railway Signal Co., Rochester; *"Molding Sands for Brass and Bronze"* —by L. B. Osborne, Hougland & Hardy, Inc., Evansville, Ind.; *"Effect of Section Size and Chills on Properties of Sand-Cast Bronzes"* —by W. B. George and A. H. Hesse, R. Lavin & Sons, Inc., Chicago.

Malleable Round Table Luncheon.

Presiding—J. H. Lansing, Malleable Founders' Society, Cleveland.

Co-Chairmen—A. M. Fulton, Northern Malleable Iron Co., St. Paul, and K. H. Hamblin, Columbia Malleable Castings Corp., Columbia, Pa.

"Atmosphere Indicators in Melting"; *"Single and Double Burner Use in Melting"*; *"Use of Large End Test Bars"*; *"Sulphur Manganese Ratios and the Effect on Other Elements."*

2:00 P.M.

Sand Research.

Presiding — B. H. Booth, Carpenter Bros., Inc., Milwaukee.

Co-Chairman — R. E. Morey, Naval Research Laboratory, Washington.

"A.F.A. Clay and Fineness Determinations Can Be Quantitative"—by D. C. Williams, A.F.A. Research Fellow, Cornell University, Ithaca, N. Y.; *"Fineness Tests of Molding Sands"*—by A. I. Krynitsky and M. Price, Bureau of Standards, Washington.

Steel.

Presiding—H. H. Blosjo, Minneapolis Electric Steel Castings Co., Minneapolis.

Co-Chairman — Charles Locke, West Michigan Steel Castings Co., Muskegon, Mich.

"Bore Cracks in Cast Steel Valves and Fittings" — by H. F. Bishop, Naval Research Laboratory, Washington, and H. F. Taylor, Massachusetts Institute of Technology, Cambridge, Mass.; *"Homogenization Heat Treatment of Cast Steel"* — by P. C. Rosenthal and J. G. Kura, Battelle Memorial Institute, Columbus; *"Thermal Relief of Stresses in Steel Castings and Weldments"*—by C. R. Jelm and S. A. Herres, Watertown Arsenal, Watertown, Mass.; *"Committee Report on Heat Treatment of Steel Castings"*—by E. R. Young, Climax Molybdenum Co., Chicago.

Symposium on Engineering Properties of Gray Iron.

Presiding—R. G. McElwee, Vanadium Corp. of America, Detroit.

Co-Chairman—W. E. Mahin, Armour Research Foundation, Illinois Institute of Technology, Chicago.

"Ductility and Elasticity of White and

Gray Irons"—by R. A. Flinn and H. J. Chapin, American Brake Shoe Co., Mahwah, N. J.; "*Gray Cast Iron Tensile Strength, Brinell Hardness and Composition Relationships*"—by C. H. Lorig and T. E. Barlow, Battelle Memorial Institute, Columbus, Ohio; "*Effect of Carbon Equivalent and Section Size on Physical Properties of Gray Iron*"—by K. Geist, Allis-Chalmers Mfg. Co., Milwaukee; "*Structural Control for Wear Resistance*"—by F. G. Sefing, International Nickel Co., New York; "*Practical Considerations Affecting Section Sensitivity of Gray Iron When Applied to Actual Castings*"—by H. C. Winte, Worthington Pump & Machinery Corp., Buffalo.

Gray Iron Shop Course—Session 3.

Presiding — T. E. Barlow, Battelle Memorial Institute, Columbus, Ohio.

Co-Chairman—W. B. McFerrin, Electro Metallurgical Co., Detroit.

"*Casting Defects Attributable to Metal*" — A.F.A. Committee on Analysis of Castings Defects.

4:00 P.M.

Sand Shop Course—Session 3.

Presiding—E. E. Woodliff, Foundry Sand Service Engineering Co., Detroit.

Subject — "*Brass and Bronze Sand Control.*" Discussion Leader — W. M. Ball, Jr., Magnus Brass Div., National Lead Co., Cincinnati.

Lecture Course—Session 3.

Presiding—H. M. St. John, Crane Co., Chicago.

Co-Chairman — C. O. Thieme, H. Kramer & Co., Chicago.

Subject—"*Brass and Bronze Foundry Control.*" Discussion Leader — D. Frank O'Connor, American Saw Mill Machinery Co., Hackettstown, N. J.

6:00 P.M.

Foundry Instructors' Dinner.

Presiding—P. E. Kyle, Massachusetts Institute of Technology, Cambridge, Mass.

8:00 P.M.

Foreman Training.

Presiding—F. E. Wartgow, American Foundrymen's Association, Chicago.

"*Engineer of Human Relations*"—by S. G. Garry, Caterpillar Tractor Co., Peoria, Ill.

Engineering Student Training.

Presiding—G. J. Barker, University of Wisconsin, Madison, Wis.

MAX KUNIANSKY, vice-president and general manager, Lynchburg Foundry Co., nominated for the vice-presidency of AFA.

Co-Chairman — C. J. Freund, University of Detroit, Detroit.

Panel Discussion: "*College Graduates vs. Employers.*"

THURSDAY, MAY 9

8:30 A.M.

Foundry Costs.

Presiding—R. L. Lee, Grede Foundries, Inc., Milwaukee.

Subject—"*Small Shop Cost System.*" Discussion Leaders—Foundry cost committee members.

Gray Iron Shop Course—Session 4.

Presiding—E. J. Burke, Hanna Furnace Corp., Detroit.

Co-Chairman — P. T. Bancroft, Republic Coal & Coke Co., Moline, Ill.

Subject—"*Metallurgy of Carbon Control in the Cupola*"—by R. A. Clark, Electro Metallurgical Co., Chicago.

9:30 A.M.

Annual Business Meeting.

Presiding — F. J. Walls, president, American Foundrymen's Association.

A.F.A. Foundation Lecture — "*Test Bars for 85 Copper, 5 Tin, 5 Lead, 5 Zinc Alloy — Design and Some Factors Affecting Their Properties*"—by G. H. Clamer, Ajax Metal Co., Philadelphia.

12:00 P.M.

Steel Round Table Luncheon.

Presiding — T. D. West, West Steel Casting Co., Cleveland.

Co-Chairman — E. C. Troy, Dodge Steel Co., Philadelphia.

Subject—"*General Discussion on Steel Foundry Practice.*"

2:00 P.M.

Brass and Bronze.

Presiding — G. K. Dreher, Ampco Metal, Inc., Milwaukee.

Co-Chairman—A. K. Higgins, Allis-Chalmers Mfg. Co., Milwaukee.

"*Use of Insulating Pads and Riser Sleeves for Producing Sound Bronze Castings*"—by H. F. Taylor and W. C. Wick, formerly Naval Research Laboratory, Washington; "*Knock-off Risers for Non-Ferrous Castings*"—by S. W. Brinson and J. A. Duma, Norfolk Navy Yard, Portsmouth, Va.; "*Sealing Bronze Pressure Castings Through Heat Treatment*"—by F. L. Riddell, Naval Research Laboratory, Washington.

Patternmaking.

Presiding—Frank C. Cech, Cleveland Trade School, Cleveland.

Co-Chairman — V. J. Sedlon, Master Pattern Co., Cleveland.

"*Use of Wood Models in Planning and Design*"—by G. W. Schuller, Caterpillar Tractor Co., Peoria, Ill.; "*Patterns as the Production Foundry Sees Them*" — by Guy Pealer, Elmira Foundry Co., Inc., Elmira, N. Y.

Gray Iron.

Presiding—T. E. Eagan, Cooper-Bessemer Corp., Grove City, Pa.

Co-Chairman — R. J. Allen, Worthington Pump & Machinery Corp., Harrison, N. J.

"*Microstructure Related to Properties of Cast Iron*"—by W. E. Mahin and H. W. Lownie, Jr., formerly Westinghouse Electric Corp., East Pittsburgh, Pa.; "*Cupola Operation and Control*"—by W. W. Levi, Lynchburg Foundry Co., Radford, Va.; "*Technical Organization of the French Foundry*"—by A. Le Thomas, President, French Technical Committee of Foundry Industries—French exchange paper.

Job Evaluation and Time Study.

Presiding—R. J. Fisher, Falk Corp., Milwaukee.

Co-Chairman—F. E. Wartgow, American Foundrymen's Association, Chicago.

"*What Management Should Know About Timestudy*" — by Phil Carroll, Jr., Maplewood, N. J.

4:00 P.M.

Foundry Costs.

Presiding — R. L. Lee, Grede Foundries, Inc., Milwaukee.

Co-Chairman—L. M. Nesselbush, Falcon Bronze Co., Youngstown.

"Meeting Foundry Competition With a Sound Cost Program"—by A. E. Grover, Cleveland Heights, Ohio.

Apprentice Training.

Presiding — F. C. Cech, Cleveland Trade School, Cleveland.

Co-Chairman—W. J. Hebard, Continental Foundry & Machine Co., East Chicago, Ind.

Panel Discussion: *"Standard Apprentice Training"*—by Carl F. Haertel, Falk Corp., Milwaukee; *"Accelerated Training Program"*—by W. J. Hebard, Continental Foundry & Machine Co., East Chicago, Ind.; *"Upgrading Systems"*—by M. J. Gregory, Peoria, Ill.; *"Veteran Training"*—by W. M. Owen, Caterpillar Tractor Co., Peoria, Ill.; *"General Summary"*—by C. J. Freund, University of Detroit, Detroit.

Lecture Course—Session 4—Steel.

Presiding—John Howe Hall, General Steel Castings Corp., Eddystone, Pa.

Co-Chairman — C. E. Sims, Battelle Memorial Institute, Columbus, Ohio.

"Steel Foundry Control" — by G. A. Lillieqvist, American Steel Foundries, East Chicago, Ind.

5:00 P.M.

Reception for Foreign Visitors.

6:45 P.M.

Apprentice Training Dinner.

Presiding—C. W. Wade, Caterpillar Tractor Co., Peoria, Ill.

Speaker—J. E. Goss, Brown & Sharpe Mfg. Co., Providence, R. I. — *"A Means to Produce Skilled and Leadership Personnel."*

7:00 P.M.

AFA Alumni Dinner.

8:00 P.M.

Sand Shop Course—Session 4.

Presiding—E. E. Woodliff, Foundry Sand Service Engineering Co., Detroit.

Subject—*"Gray Iron Sand Control."* Discussion Leaders: H. C. Winte, Worthington Pump & Machinery Corp., Buffalo, N. Y., and T. W. Curry, Lynchburg Foundry Co., Lynchburg, Va.; *"Factors to Consider When Purchasing Core Sand"* by H. Louette, Warden King, Inc., Montreal.

Job Evaluation and Time Study.

Presiding — Robert J. Fisher, Falk Corp., Milwaukee.

Co-Chairman—F. E. Wartgow, American Foundrymen's Association, Chicago.

Round Table Discussion—*"Time Study Practices."* Discussion leaders: P. Carroll, Jr., Maplewood, N. J., and J. C. Lewis, Associated Engineers, Inc., Fort Wayne, Ind.

Apprentice Training.

Presiding — C. W. Wade, Caterpillar Tractor Co., Peoria, Ill.

Co-Chairman—J. Grennan, University of Michigan, Ann Arbor, Mich.

"Passing On the Know-How"—by R. L. Lee, General Motors Corp., Detroit.

FRIDAY, MAY 10

9:30 A.M.

Sand Shop Course—Session 5.

Presiding — R. H. Jacoby, Key Co., East St. Louis, Ill.

Subject—*"Steel Foundry Sand Control."* Discussion Leader — E. E. Woodliff, Foundry Sand Service Engineering Co., Detroit.

10:00 A.M.

Gray Iron

Presiding—H. Bornstein, Deere & Co., Moline, Ill.

Co-Chairman—V. A. Crosby, Climax Molybdenum Co., Detroit.

"Effect of Heat Treatment on Endurance Limit of Alloyed Gray Cast Iron" — by T. E. Eagan, Cooper-Bessemer Corp., Grove City, Pa.; *"Engineering Properties of Heat Treated Cast Irons"*—by J. S. Vanick, International Nickel Co., New York. Discussion of Charts, *"Cupola Operations Handbook"*—by R. G. McElwee, Vanadium Corp. of America, Detroit; *"Theories of Gray Cast Iron Inoculation"*—by H. W. Lownie, Jr., formerly Westinghouse Electric Corp., East Pittsburgh, Pa.

Steel.

Presiding—C. H. Lorig, Battelle Memorial Institute, Columbus, Ohio.

Co-Chairman — J. A. Rassenfoss, American Steel Foundries, East Chicago, Ind.

"Preliminary Investigation of Methods for Control of Hardenability at the Furnace," by G. Vennerholm, Ford Motor Co., Dearborn, Mich.; *"Methods of Quality Control in the Foundry,"* by J. W. Juppenlatz, Lebanon, Pa.; Committee Report, *"Production of Steel for Castings,"* by C. E. Sims, Battelle Memorial Institute, Columbus, Ohio; *"Conventional vs. Washburn Risers for Steel Castings,"* by W. E. Jones, American Steel Foundries, Bettendorf, Iowa.

2:00 P.M.

Steel.

Presiding—J. W. Juppenlatz, Lebanon Steel Foundry, Lebanon, Pa

Co-Chairman—J. B. Caine, Sawbrook Steel Castings Co., Cincinnati.

"Low Temperature Properties of Certain Steels," by C. E. Sims. and F. W. Boulger, Battelle Memorial Institute, Columbus, Ohio; *"Production of Grand Slam Bomb Castings,"* by Basil Gray, English Steel Corp., Sheffield, England—Institute of British Foundrymen Exchange Paper"; *"Susceptibility of Steel to Hot Tear Formation in Casting,"* by N. P. Gelperin, Moscow Div., State Institute, "Giprotjagmashe," Moscow; *"Technological Principles of Casting Design,"* by Victor M. Shestopal, Stalin Machine Tool Institute, Moscow; *"Committee Report on Non-Destructive Testing,"* by C. W. Briggs, Steel Founders' Society of America, Cleveland.

Gray Iron Welding.

Presiding—E. C. Jeter, Ford Motor Co., Dearborn, Mich.

Co-Chairman—John Crowe, Air Reduction Sales Co., New York.

"Metallurgical Aspects of Repair Welding of Gray Iron," by J. A. Blastic, Detroit Diesel Div.; J. A. Griffin, Pontiac Motor Div.; and J. M. Diebold, General Motors Truck and Coach Div., General Motors Corp., Detroit; *"Physical Aspects of Welding Gray Iron Castings,"* by W. Pfander, Ford Motor Company, Dearborn, Mich.; *"Welding Heavy Gray Iron Sections,"* by L. J. Larsen, Allis-Chalmers Mfg. Co.

Brass and Bronze.

Presiding—G. P. Halliwell, H. Kramer & Co., Chicago.

Co-Chairman—A. H. Hesse, R. Lavin & Sons, Inc., Chicago.

"Distribution of Mechanical Properties in Sand Cast Bronzes," by R. H. Brouk, R. G. Hardy, and B. M. Loring, Naval Research Laboratory, Washington; Committee Report on *"Manganese Bronze,"* by G. K. Dreher, Ampco Metal, Inc., Milwaukee; *"Manganese Bronze,"* by H. E. Arblaster, Institute of Australian Foundrymen.

4:00 P.M.

Lecture Course—Session 5.

Presiding—W. H. Rother, Buffalo Foundry & Machine Co., Buffalo.

Co-Chairman—J. S. Vanick, International Nickel Co., New York.

Subject—*"Gray Iron Foundry Control"*; Discussion Leader — W. A. Hambley, Allis-Chalmers Mfg. Co.

7:00 P.M.

Annual Dinner.

Presiding — F. J. Walls, President.

Presentation of AFA Medal Awards and Honorary Life Memberships.

Speaker—Brig. Gen. D. Armstrong, Army Industrial College.

AIME Openhearth Meeting

Stresses Quality and Cost

McKUNE Award Winners, Dr. C. R. Taylor and A. P. Woods, American Rolling Mill Co., presented a paper entitled: "A Statistical Method and Results of Study of Factors Affecting Openhearth Production Rates." This annual award was established in 1940.

• With a one year interruption because of the war, AIME resumed its national openhearth meetings with the 29th meeting in 21 years. Costs and quality problems dominated the meeting and seem to keynote the meetings for some years to come.

THE 29th Openhearth Conference of the American Institute of Mining and Metallurgical Engineers, held in Chicago on Apr. 24, 25, and 26, made an about face from the trends of the AIME conferences of the past five years, leaving behind the subjects of production for victory regardless of cost and again keynoting cost and quality. The topics chosen for the conference had direct bearing upon these factors. eliminating high production factors with their accompanying high costs and waste of natural resources.

In his introductory remarks, A. P. Miller, general chairman of the conference, stated that although peacetime problems do not carry the stresses of armed conflict, the success with which they are met will measure future developments in the industry and will exert influences just as important on national progress. The sharp upward spiral of production costs must be reversed if a profit margin sufficient to insure soundness of the industry is to be maintained. Cost reductions will depend largely upon improved methods and economies in plant repairs and maintenance, upon closer control of output per man-hr, upon the development of labor saving devices, and upon an increase in the ingot-to-product yield.

Leading off the technical discussions of the conference, the paper that won the 1946 McKune Memorial Award was presented. Prepared by Dr. C. R. Taylor and A. P. Woods, American Rolling Mill Co., Middletown, Ohio, the paper, "A Statistical Method and Results of Study of Factors Affecting Openhearth Production Rates," was read by Mr. Woods. The McKune Award has been an annual award since 1940, commemorating the memory of Frank B. McKune, who was active in the openhearth conference since its inception in 1925.

The Effect of Openhearth Charging Rate on Production

THREE papers were presented on the effects of charging rates on openhearth production. J. F. O'Brien, superintendent of openhearths, Carnegie-Illinois Steel Corp., Chicago, told of a study that was being made in his plant on the subject, with considerable data already collected on charging and heat time, cold metal charged, furnace age, and carbon and melt and tap. He stated that:

To reduce the heats to a common iron charge and carbon at tap, the heat time was corrected for the cold iron charged and all heats were assumed to have tapped at 0.15 per cent carbon. Heat times were changed accordingly. Heat times were not changed to compensate for furnace age or carbon at melt because the groupings by charging times and tons per melting hr had very nearly the same average furnace age and carbon at melt. The heats were grouped into six groups of 20 min. increments of total charging time and the average production determined for each group. The variation in production was 1.34 tons per hr or 7.3 per cent of the mean production of all heats.

To determine the average total variation, the heats were arranged according to production in seven groups or approximately the same number of heats. Calculation of the average production of each group showed a difference of 5.5 tons per hr or 29.8 per cent of the mean with a differential of only 28 min. in charging time. Since, in grouping the heats with regard to charging time, a variation of 7.3 per cent from the mean for a difference of over 80 min. of charging time was found and there remained 22.6 per cent for which to account. Quality of scrap and iron affect produc-

tion markedly, but it was felt that in the heats studied they were sufficiently uniform to assume that most of the differences in the tonnage groupings were due to the charging.

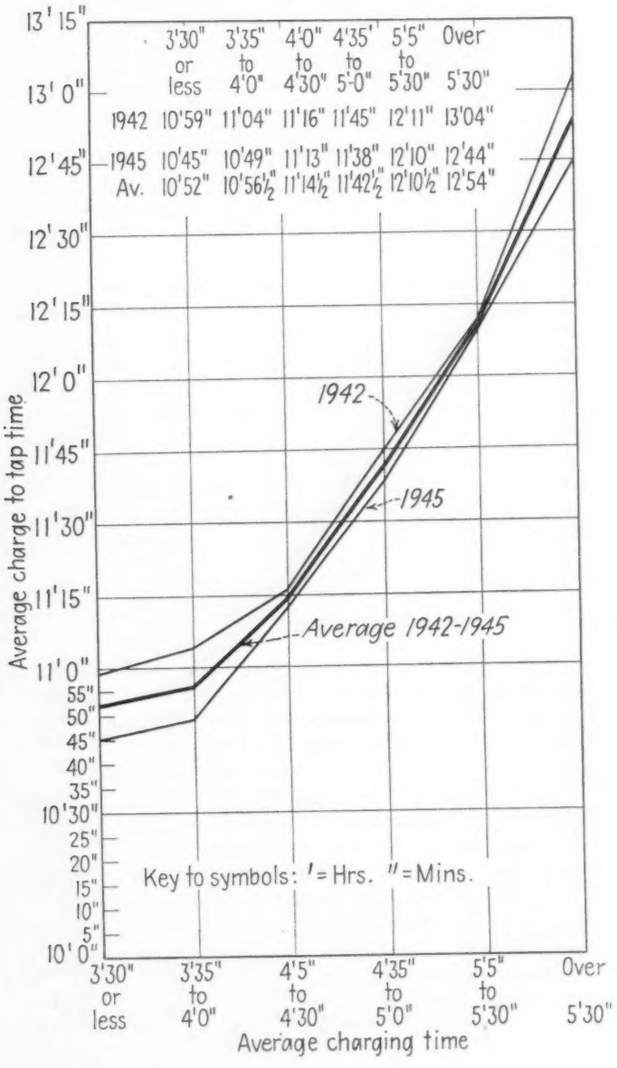
Analyses showed the charging times of 25 and 100 per cent of the charge to be responsible for approximately 15 per cent of the variation in production. The time required to charge 50 and 75 per cent of the charge is important, but to date reliable correlation has been impossible to obtain.

Murray J. Miller, openhearth superintendent, Republic Steel Corp., South Chicago, Ill., gave the results of studies made at the Republic plant, which involved six ranges of charging times.

The same number of heats in each charging range were picked at random from each month in the years 1942 and 1945. To arrive at average results, the heats used in this study represent the same number of heats from each furnace in each month of the year, thus taking into consideration all general factors affecting charge to tap time other than official charging time. A graph, fig. 1, was plotted of the studies made in the year 1942 and the year 1945 as well as an average of the two years. This graph was obtained by plotting the average charging time in hours versus the average charge to tap time in hours. The graph reveals:

1. When charging time is increased from 3½ hr to 4 hr a slight increase of charge to tap time results.
2. In the charging range of 4 hr to 4½ hr a definite increase in charge to tap time results to the extent of 18 min. or approximately 0.60 min. for each minute increase in charging time.
3. As the charging time is increased from 4½ hr to 5 hr, charge to tap time increases to the extent of 0.93 min. for each minute increase in charging time.
4. An increase in the charging time of 5 hr to 5½ hr results in increased charge to tap time of 28 min. or a ratio of 0.93 to 1.0.
5. A very decided increase is noted when charging time exceeds 5½ hr since the ratio becomes approximately 1.45 to 1.0.

FIG. 1—This shows the effects of variations in charging times on the charge to tap time lapse. As the charging time increased, the heat time was slower. The tests made in 1945 showed results slightly better than in 1942, the same relationship existed between the charging time and the charge to tap time.



Even though the tons per hour in 1945 were improved over that of 1942 the same relationship existed between the charging time and charge to tap time. These figures include soft or extremely high melts and represent average conditions during charge to tap period.

A definite relationship exists between time of heats and total charging time because the time of heats increases as total charging time goes up. This conclusion is further augmented by the fact that as charging times goes over 4½ hr, the time of heats is much more affected than if it fluctuates between 3 hr and 4½ hr.

Vaclav Gregor, assistant to the openhearth superintendent, Carnegie-Illinois Steel Corp., Gary, listed seven points upon which production in an openhearth shop depends. These were: 1. Size and design of furnaces and number operating, 2. Fuel used, 3. Quality of steel made, 4. Type of charge, 5. Quality of scrap, hot metal, charge ore, etc., 6. Plant layout and charging equipment, and 7. Management which plans the production and operates the shop with the idea to obtain satisfactory quality of product at a low cost.

He continued, Gary Steel Works openhearth department has five openhearth shops with a total of 53 furnaces. Nos. 1, 3, and 4 shops each have 14 furnaces tapping an average of 145 ton heat.

The charge, depending on quantity of hot metal produced at blast furnaces and quality of steel made, is either a high hot metal charge or high scrap charge as shown in table I or a combination of both.

Scrap used in 24 hr on high scrap charges is 2704 boxes per day, and on high hot metal charges, is 832 boxes per day. Difference in time is 45 min. per heat in favor of high hot metal charge, when hot metal analysis runs 0.80 per cent to 1.10 per cent Si., 0.025 to .030 per cent S. Phosphorus content of metal is 0.20 per cent. About 85 per cent of all heats are produced with a high hot metal charge and the balance with high scrap charges. When all heats are charged with high scrap, the difference in time of heats is on the average 1 hr 25 min. longer than on high hot metal charges.

In all above sandwich charging, care is taken by the charging machine operator and the first helper

that scrap and ore are spread in even layers over the whole hearth area. During charging and melting down, up to hot metal addition, maximum fuel input per hr is maintained. When coke oven gas is used in conjunction with liquid fuel, the ratio of gas to liquid fuel is greatest during this period. With a high hot metal charge the scrap should be in the furnace in 2 hr after beginning of charging and hot metal in after 3½ hr. Scrap on a high scrap heat charge should be in the furnace in 3 hr and furnace should be ready for hot metal in 4½ hr after beginning of charging.

The time of the addition of hot metal has considerable influence on time of the heat. The furnace charge should be thoroughly heated and melting down when the metal is poured into the furnace.

Effect on Costs of Furnaces With One Checker at Each End

TWO papers were presented showing the comparison of furnaces having one checker and the conventional two checkers at each end, as to production, fuel, and refractory consumption. H. L. Allen, openhearth superintendent, Republic Steel Corp., Cleveland, said that Republic rebuilt its No. 14 furnace at Cleveland in 1941 with a single checker chamber on each end, and at the same time rebuilt three other furnaces in the same shop with the conventional two checker ends.

Table II shows the comparison of the single checker chamber furnace, No. 14, against two of the double chamber furnaces for the years 1942 to 1945, showing the tons per hr and fuel consumption as well as total tonnage. From these figures it appears that there is nothing to be gained from the single checker chamber furnace in the matter of fuel consumption or tons per hr. It is felt that the crew on No. 14 furnace is not up to the caliber of either of the other furnace crews and this may account for whatever variation is evident in the figures.

In the matter of refractories, the No. 14 furnace was originally built with a single arch of silica brick in April, 1941. The furnace ran until January, 1943, tapping 1058 heats, when a patch was made. Another repair was made in October, 1943, after 1552 heats. The original roof was replaced in February, 1944, after 1683 heats. The new roof has been repaired once, in December, 1945, at 1028 heats. This roof will be replaced with 13½ x 6 x 3 in. Valentine brick during the next rebuild.

It is apparent that the single arch silica brick checker chamber roof is out of line with standard two arch construction. As a matter of record, however, one other single arch construction furnace, built with Valentine brick, to date with about 700 heats tapped shows no sign of wear.

Lee A. Lambing, superintendent of openhearths at Jones & Laughlin Steel Corp.'s Pittsburgh Works, told of his experience with single checker chamber type furnaces. Five 175 ton and four 275 ton tilting furnaces at J & L Pittsburgh Works were originally built with a gas and an air checker chamber on each end. Because tar and later residual tar shortened the life of the checkers, the air passages had to be increased in size to such an extent that there was not enough heating surface left to furnish the necessary preheat for efficient operation. A flat suspended checker roof was tried on one 175 ton furnace but the division walls between the changers were retained for fear of channeling. The division walls were later removed and

TABLE I

Number of Charging Boxes of Material Used for Charging a 14 Furnace Openhearth Shop in 24 Hr

	High Scrap Charge	High Hot Metal Charge
Steel Scrap	2704 Boxes	832 Boxes
Hot Metal	.....	.....
Iron Scrap	184 Boxes	.....
Ore	.....	208 Boxes
Limestone	208 Boxes	208 Boxes
Total	3096 Boxes	1248 Boxes

TABLE II

Comparison Between Furnaces of Conventional Design and of Single Checker at Each End

	Double Checker Chamber Furnaces						Single Checker Chamber Furnace		
	No. 3			No. 8			No. 14		
	Tons	Tons per Hr	M. BTU's per Ton	Tons	Tons per Hr	M. BTU's per Ton	Tons	Tons per Hr	M. BTU's per Ton
1942	122,806	15.2	4.164	123,606	15.1	4.143	122,389	14.8	4.202
1943	128,482	16.0	4.241	123,216	16.3	4.248	117,468	15.6	4.193
1944	116,885	15.8	4.010	125,976	16.0	3.950	117,636	15.8	4.270
1945	103,761	14.6	4.856	95,973	14.5	4.538	104,271	14.4	4.541
Average	117,983	15.4	4.299	117,193	15.5	4.200	115,441	15.2	4.293

the voids filled with checkers. The furnace then behaved better than with the divided checkers.

The number of days until the first checker cleaning increased 22.5 pct and the tonnage per campaign increased 24.5 pct. Furnace rates and fuel consumption were not affected much. The greatest gain was in rebuilding costs per operating hr. which decreased 41.4 pct. This furnace was equipped with Blaw-Knox valves previous to the checker change.

The checker chambers were lengthened on another 175 ton furnace and the division walls were removed. Flat checker roofs were built and Blaw-Knox valves installed. The first full month after these changes the furnace broke all production records in the plant. Tons per hr increase 9.9 pct on duplex steel and 8.1 pct on scrap and hot metal steel. While rebuilding costs for labor and material have increased $45,000 per yr on each adjacent furnace, the rebuilding costs on this furnace have decreased $1000 per yr, making a total saving on rebuilding costs of $46,000 annually.

Just before the war, the same kind of change was made on a 225 ton furnace and its performance likewise justified the change. Tons per hr on scrap and hot metal steel increased 5.3 pct and rebuilding costs per operating hr decrease 11 pct. Rebuilding costs averaged $47,000 a year less than the rebuilding costs on two adjacent furnaces.

On another furnace, flat checker chamber roofs were installed and the division wall removed, without lengthening the chambers or changing the valves. This furnace, also, is performing satisfactorily but the change has been too recent to quote any conclusive figures. So far, tons per hr on scrap and hot metal steel have increased 1.7 pct and rebuilding costs per operating hr have decreased 17.2 pct. Some benefits can be attributed on these furnaces to the Blaw-Knox valves and changes in flue construction, but there are benefits obtained on a furnace previously equipped with these valves and on another furnace where valves were not changed. Recommendations have been made for changing from double to single checkers on the remainder of the J & L furnaces and the work is now underway.

Desulphurizing Cupola Iron for Openhearth Use

IN A paper that described the practice of using cupola iron as the hot metal charge, W. H. Steinheider, openhearth metallurgist, Sheffield Steel Corp., Kansas City, stated that the company put two such units into operation in 1938 to utilize light agricultural scrap available in the area and to increase production by having hot metal as part of the openhearth charge. Production of 15 to 18 tons of cupola iron an hr is sufficient to maintain a charge of ⅓ hot metal and 2/3 scrap in the openhearth.

When the cupolas first operated an attempt was made to desulphurize in small tilting ladles which were situated between the cupolas and a holding furnace, but this proved unsuccessful and a change was made so that the metal passed directly from the cupola to a tilting holding furnace.

Desulphurizing was next done by adding soda ash to the bottom of transfer ladles and pouring through the soda ash. It became necessary to eliminate the fumes resulting from the use of the desulphurizing agent, and an exhaust hood was placed over the ladle receiving the metal and the soda ash was introduced through a funnel in the hood, constructed to direct the soda ash directly into the stream of metal.

Tests were conducted to determine the most effective method of desulphurizing with the equipment available. At the start of the tests, samples were taken at the cupola, holding furnace, the hot metal ladle after skimming, and the alkali slag after desulphurizing. The metal in the holding furnace was consistent at any one time, so later only one test was taken from the holding furnace.

In the first series of tests opproximately 13.5 lb of soda ash per net ton of metal was added. Results were not consistent but on an average the silicon was reduced 18.3 pct and the sulphur was reduced 37.4 pct. The chemical efficiency of the soda ash was 24.4 pct. In this series of tests it was disclosed that the temperature of the metal had a bearing on the sulphur reduction, and this was emphasized later when desulphurizing was done on successive ladles, starting with ladles which were comparatively cold.

In the next series of tests approximately 17.7 pct of soda ash per net ton of metal was added. To pour 45,000 lb of hot metal takes about 5 to 6 min. In some instances the soda ash was added as soon as possible and in others added evenly during the pour. The ladle is not very hot when the first metal is poured and is always hot for the second ladle of metal, for as soon as the first ladle of metal is poured into the openhearth furnace, the ladle is returned for the second ladle of metal. With soda ash added fast, the average reduction of sulphur, on the first ladle, was 47.8 pct, and with the soda ash added slow the sulphur reduction was 42.0 pct. In the same series of tests, with the soda ash added fast, the average reduction of sulphur on the second ladle was 53.1 pct, and with the soda ash added slowly the sulphur reduction was 44.7 pct.

In a third series of tests, an average of 22.3 lb of soda ash per ton of metal was used. The soda was added as fast as possible and samples were taken on the first and second ladles. In the first ladle the chemical efficiency was 27 pct, and the sulphur was reduced 59.1 pct. In the second ladle the chemical efficiency was 30 pct and the sulphur was reduced 61.3 pct.

With high sulphur input it is desirable to have fluid slags of high basicity to reduce sulphurs to desired levels. Finish slags usually have a lime silica ratio of 3.0 to 3.5 with FeO of 9 to 12 pct on high carbon heats, and 16 to 20 pct FeO on low carbon heats. On the average heat to produce a sulphur of 0.040 to 0.050 pct, 12,600 lb of burned lime, or 4.5 pct of the metal charge is used. On heats where a maximum of 0.040 is specified, 14,000 lb of burned lime, or 5.1 pct of the metal charge is used. Considerable spar is used in working the slag, especially on high carbon heats to produce a fluid active slag.

Approximately 2/3 of the lime is added on the scraped bottom and the last ⅓ is usually added about 1 hr after the addition of the hot metal. Burned lime is used, because of the saving in time and the saving of carbon which would be lost in the calcining of limestone. Most of the lime used is not dead burned, and some calcining does take place.

Substitution of Coke for Pig Iron in Openhearth Charge

SUCCESS in reducing pig iron charges in the openhearth can be obtained through partial substitution of coke, practice described by E. H. Schwartz, Wisconsin Steel Co., and Oliver P. Luetscher, Keystone Steel & Wire Co., indicates. Control can be as accurate with reduced iron charges as with normal charges, Mr. Schwartz said. He added evidence showing graphite to be more efficient than coke.

The initial goal described by Mr. Schwartz was to reduce the iron charge so that the proportions would be 75 pct scrap and 25 pct hot metal, plus the necessary coke. Due to reduced quantities of iron charged, the limestone charge was reduced and a trial group of heats made. The first results provided some rather high raw melts, so that additional groups of heats were made with increased limestone charges.

The average experience with three groups of heats, indicated that a regulated percentage of scrap and metal (total metallic charge) could be maintained Within reasonable limits, the limestone charge can be adjusted to provide a melt carbon and slag at melt suitable to a rather wide variation of requirements.

Further experimentation was made with a group of heats using graphite, as with the same metallic charge. Results of this test were good. The additional cold charging time during these heats was attributed to general shop conditions rather than this process itself.

Experiments were made charging the coke of these charges at several places of the charge; that is, all on the lime, all in the center of the scrap charge and split half on the lime and half in the middle of the scrap charge. No variation of efficiency was noted, with the exception that if the coke was allowed to remain in the furnace at an incandescent stage for more than a very short time uncovered, marked reductions of efficiency were obtained. The graphite behaved throughout the trial much the same as coke, but proved efficient.

Mr. Luetscher described how Keystone Steel & Wire Co. several years ago made a number of heats with very low iron charges and later made a considerable portion of its production with no iron at all, using coke for the carbon requirements with very little or no silvery iron or spiegel. The only iron was a pan of northern pig for a reboil prior to tapping.

One of the most important factors noted in the successful use of high percentages of coke in the charge was the ability of the furnace to melt rapidly and to keep a roof on while the heat was dead under a heavy blanket of lime and coke or when foaming was encountered.

In general it was found that a ratio of 1 lb of coke to replace 15 lb of pig iron was a good working basis. This ratio, the determining factor in the effect of the use of coke or other forms of carbon on the charge cost, was greatly affected by the silicon content of the charge, making the use of cast scrap or high silicon pig of considerable benefit. The use of silvery iron or ferrosilicon in the charge was shown to be entirely practical, but its use in considerable quantity required care in charging.

The position of the coke and silicon in the charge is of great importance and must be governed by the nature of the charge and the amount of coke used. With light scrap and a large percentage of coke it is best to distribute the coke throughout the charge but with heavy scrap this is not always practical.

In the use of ordinary foundry coke the ratio of sulphur to carbon was said to be the determining factor rather than the total sulphur. This ratio of sulphur to carbon in the coke is about the same as in pig iron, about 1 to 89, and in some pitch or petroleum cokes it runs as low as 1 to 2500. With material of this kind a lower lime charge and lower spar consumption can be attained.

In general, the use of coke seems to show a definitely better ingot yield than the use of pig iron, probably because of the lower silicon and combined carbon loss and the lower iron loss in the slag on account of the lower slag volume. Some recent results on a series of high carbon heats apparently contradict this statement but considerable silvery iron and spiegel has been used in these heats and they were few in number and therefore not conlusive.

Taking all of these factors into account there are very definite advantages in charge cost to be gained by the substitution of carbon in almost any form for pig iron. At present prices of coke and alloys a differential of only about $2.30 per gross ton between pig iron and heavy melting scrap is needed to make the substitution advantageous. However there are a good many other factors to be considered which change the picture very much.

The question of alloy contamination resulting from the use of larger percentages of steel scrap is in many cases the limiting factor which governs the maximum possible percentage of scrap and therefore coke which may be used. Very often this eliminates the use of coke entirely. If these conditions are favorable to the use of coke there are still a number of factors which may increase the total cost above net metal to a point which more than offsets any possible saving in charge cost.

In the first place, the use of a large quantity of coke slows up the charging time on account of its bulk and further, even with the most advantageous placing of the coke in the charge a great deal of it will rise to the surface before it can go into solution. This may cause the heat to lie dead until enough carbon and temperature can be picked up to get an action. In many cases the highly oxidized condition of the bath may then cause foaming which results in more trouble. These conditions may cause a great deal of delay and are greatly aggravated by a slow furnace.

Aside from the increased time per heat resulting from these troubles the rebuild and repair costs are sharply increased both by the longer time and by the more severe flame action during the dead period of the heat and by the foam which may develop. Unless the furnace is able to develop a very hot flame and keep the heat on the bath it may become impossible to keep the rebuild and repair costs within practical limits.

The fuel costs are affected similarly to the rebuild costs by these conditions and both will, even under the best conditions, increase directly with the time of the

heats and under bad conditions they may increase much faster than that.

The effect of replacing varying amounts of pig iron with coke is shown in the following figures taken from our data on large numbers of consecutive heats:

	Charge to Tap	Tap to Tap
Average Time, All Pig Iron, No Coke..	12 Hr, 45 Min.	13 Hr, 40 Min.
Average Time, Using Coke to replace ½ of Pig	13 Hr, 42 Min.	14 Hr, 37 Min.
Average Time, Using All Coke no Pig Iron	14 Hr, 55 Min.	15 Hr, 50 Min.

If it is assumed that the items of re-build cost and fuel consumption will remain approximately constant on an hourly basis in all three of the above cases, it will be seen that the replacement of one half of the pig iron with coke will result in a rise of approximately 7 pct in the costs and the complete substitution will cause a further rise to approximately 16 pct. As explained above these figures are the best that may be hoped for in most cases.

A great many other items in the cost above net metal would also be affected by the use of a large percentage of coke, including the producing labor. The exact effect would depend upon the wage setup, but in shops where tonnage forms a large part of the pay the attitude of labor toward reduced "take home pay" must be taken into account and at this time adjustments of rates would probably have to be made.

Some items of labor cost are of course in the nature of fixed charges and their importance depends principally upon the need for tonnage. In a period of slack demand for steel the savings that might result from the use of coke can therefore be better realized than at a time when tonnage is needed as the savings are actual reductions in expense while some of the losses would become merely bookkeeping items.

The real problem in the successful use of coke to replace pig iron is the loss of time which its use entails. Various forms of carbon have been used, including graphite, crushed electrodes, pitch coke, petroleum coke, and a particularly hard form of pitch coke which is sold under a trade name. They all seem to present the same problems in that respect. Some of the varieties mentioned seem to go into solution better than others and are nicer to handle in the furnace but some recent tests which looked very promising showed just about the same loss of heat time when the results were averaged. It may well be that better methods of charging the necessary components of the melt will yield the solution of the problem.

New Refractories and Basic Lined Openhearths

A PAPER delivered at the meetings described a new Michigan magnesite, a synthetic material extracted from waste brine containing about 10 pct magnesium chloride. It is termed a synthetic material because it is the result of a chemical extraction process similar to Seawater or Cape May magnesites, as distinguished from Russian, Austrian or Washington magnesites that are mined practically as such. Michigan magnesite is made at Manistee, Mich., where the waste brine from chemical companies is treated with dolomitic milk of lime wherein the calcium hydrate precipitates magnesium hydrate from the magnesium chloride. This, together with magnesium hydrate and magnesium oxide from the dolomitic lime, is recovered as a sludge by the use of thickeners and filtration. The sludge on a dry basis will contain about 95 pct magnesium oxide, the remainder being composed mainly of lime with 1 pct silica and small amounts of iron and aluminia.

The material is mixed with iron oxide and sufficient silica to finish a final analysis of 4.5 pct silica, 5.5 pct iron oxide as Fe_2O_3, and is heated in a rotary kiln. Because of the low silica, for proper sintering of the magnesite, the kiln must operate at such a temperature that the material at the exit end reaches 3200° F. Ceramic and operating tests have shown that the material, because of high sintering temperature and low silica content, has less shrinkage than the conventional competitive magnesites. Experience shows that bottoms made of the material crack less on cooling, set harder, and slake less readily.

While the grain size is considered fine, it is reported that the material works the same in the furnace as Washington magnesite except it requires 3 to 4 pct more slag mixed with it to fuse properly. Grades have been established for use in tapholes, on frontwalls, in holes in the slag line, on backwalls, in holes in banks and necks, and where large repairs are required.

A typical analysis of this magnesite is: SiO_2, 4.5 pct; Fe_2O_3, 5.5 pct; Al_2O_3, 2.0 pct; CaO, 4 pct; and MgO, 84.0 pct. Typical grain sizing is:

Screen Size	Pct Passing Through
⅜-in.	100
No. 4	88
No. 8	36
No. 16	4
No. 30	1.5

In a discussion of the use of basic linings for openhearth port ends, C. R. Fon Dersmith, superintendent of steel production, American Rolling Mill Co., gave a short report on the installations, cost data and performance of basic end furnaces as experienced by Armco. Armco had basic ends installed in three furnaces, one in October 1944, one in December 1945, and one using ferro clip type brick that was supposed to light up last week. The latter two have more suspended Detric panels above floor level than the first furnace built.

The first furnace, it was felt, after 900 heats was even in costs with the conventional silica furnaces, and is still in operation. Repair cost, including the total installation costs are estimated to be on the first furnace $0.992 per net ton, compared with the cost of the conventional silica furnace of $0.978 per net ton. The furnace made 3000 tons more steel since its installation than any other furnace in the shop, and this year to date the two basic end furnaces in operation during that period have made 1500 and 1800 tons more of steel, respectively, than any other furnace in the shop. With regard to tons per hr output, the first furnace has been consistently better than the shop average.

Further, maintenance employees, especially bricklayers, like to work on this type of furnace because of the ease with which it can be patched. It also does not create an industrial dust hazard. First helpers have

learned to like this type furnace, and furnace operators, supervisors and masons are in favor of this type of unit.

John J. Golden, division superintendent, steel production, Gary Works, Carnegie-Illinois Steel Corp., told of the design of all basic lined openhearth furnace that Carnegie-Illinois intends to install at South Works. He indicated that it was his belief that there was not too much variance or difference in the available basic materials in so far as quality is concerned, but pointed out several requirements regarding the properties of basic materials that are necessary to satisfactorily complete the project.

Mr. Golden pointed out that the roof was the greatest problem in the all basic lined openhearth, but that study indicates that the choice of the roof will be a combination of the sprung and the suspended type roof. Certain factors make both of them unsatisfactory in themselves, but a combination of the desirable features of these roofing methods will probably solve the problems.

It will likely be some time before Carnegie-Illinois actually begins construction of this furnace, but it will probably be the first all basic lined openhearth ever built in this country. Ford and Steel Co. of Canada, at Hamilton, Ont., have experimented with parts of the linings being constructed of basic materials, as has American Rolling Mill Co. Likewise, basic lining materials have been used very extensively by European steel manufacturers.

German Process Applies Coating to Steel Gears

COMBINING the favorable bearing qualities of bronze with the strength of steel is the aim of a process developed in Germany whereby a bronze coating of about 0.02 in. is applied to steel gears. This process, described by Sam Tour, Tour & Co., Inc., New York, in a Joint Intelligence Objectives Agency report, was developed by a Dr. Burchart of the VDM, Hedderheim Co., Germany, and may be applied to shapes other than gears.

In this process, a steel gear blank is machined to proper dimensions so that when a layer, about 0.02 in. thick, is added to it, the gear will be of the proper size. This gear blank is then copper-plated with approximately 0.02 in. of copper. The plated gear blank is placed in a furnace, which is connected to a gas train system, so that a gas can be introduced into the furnace and withdrawn from it and circulated continuously. The furnace and charge are heated to around 1290°F and the special gas atmosphere passed through for a period of 10 to 12 hr. The work is then cooled in the furnace, the atmosphere removed, the furnace opened and the work withdrawn. The copper plate which had been applied to the steel gear has now been impregnated with tin to an average content of 10 pct tin. The actual tin content varies from the surface of the copper to the surface of the steel with a maximum of 20 pct at the surface and a minimum of 5 pct near the steel.

The atmosphere for the furnace is created by passing a mixture of 95 to 99 pct hydrogen and 1 to 5 pct chlorine over a bath of molten tin metal to produce a product containing approximately 5 to 10 pct tin chloride. This product, in the form of preheated hydrogen plus tin chloride vapor, is introduced into the furnace. It is claimed that the tin chloride breaks down to deposit metallic tin on the copper and forms the bronze alloy. It is further claimed that the chlorine liberated reacts with the hydrogen present to form hydrochloric acid, which is removed from the exhausted gases by means of a water wash and the residual hydrogen is pumped back into the circulating system. The chlorine for the system is reported to be made by electrolysis of hydrochloric acid, rather than by using chlorine gas from bottles.

After the vapor treatment, the bronze coated gears are ground or filed to finished dimensions and are ready for use.

Pickling Acid Consumption Reduced

A MODERNIZED pickling technique whereby sulfuric acid consumption has been reduced by about 67 pct is reported by Dr. Paul de Lattre in *Sheet Metal Industries*, February 1946. The process described is in use at the Tubes de la Meuse works in Belgium, which produces butt-welded tubes.

The pickling and "spent-liquor-treatment" operation at this plant have been transferred into a closed-circuit setup, so that the entire operation is automatic. When the pickling solution has been sufficiently contaminated with ferrous sulfate, so that regeneration is necessary, the liquor is siphoned into a duct under the level of the tank bottom. The liquid then flows by gravity into a settling tank, where the sludge is allowed to settle. The clear liquor is decanted into crystallizers fitted with a patent agitation system—which works with a small power consumption and is practically devoid of wear. The liquid is cooled very rapidly (less than 1 hr).

Cooling of the liquid and addition of H_2SO_4 causes the ferrous sulfate to crystallize out of the mother liquor. The latter returns directly to the pickling tank while the ferrous sulfate crystals are dried in a special type of centrifugal drier. Periodically, some water is added to the pickling tank to make up for the steady reduction in volume due to the ferrous sulfate removal.

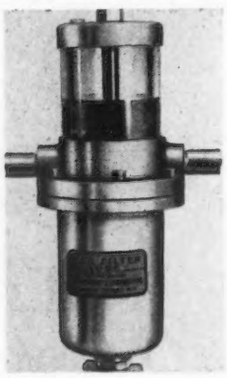
In addition to the saving in acid consumption, the improvement in surface finish and regularity obtained in the pickling operation are also noteworthy. Further, the simplicity of the operation is evidenced by the fact that one man operates the whole recovery plant and two men easily handle the pickling department.

New Equipment . . .

Plant Service

. . . Various developments of general utility in all types of plant service including flange-jacks, marking machines, ball bearings, intercommunication control and other devices are described in this week's digest of manufacturers' announcements.

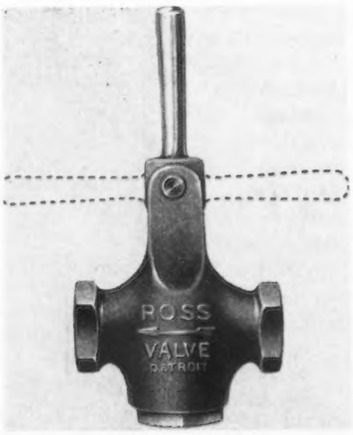
A COMPACT pneumatic filtering unit combined with a precision lubrication, CCA filter-lube, has been announced by *CCA Products Engineering*, P. O. Box 671, Glendale, Calif. The primary use of this instrument is for installation as close as possible to the equipment it is intended to service, including air cylinders, vises, chucks or any reciprocating or rotary air tools. A needle valve oil regulator, easily adjustable to meet all varying lubrication requirements, permits the correct amount of oil to mix with filtered operating air. It is claimed to be designed to prolong the life of all



types of pneumatic equipment, prevent freezing of air-operated devices, and deter the inroads of corrosion.

Shut-Off Valve

THE addition of a shut-off valve to their already large line of poppet type, air-operated valves, has been announced by *The Ross Operating Valve Co.*, 6459 Epworth Blvd., Detroit. This valve is said to be primarily designed for use in air lines, but it is also recommended for use in gas and low pressure liquid lines. Five outstanding features claimed for this valve are:



(1) full flow, that is to say, full pipe area; (2) quick acting, just a flip of the lever opens or closes the valve; (3) self-locking, locks automatically in both closed or open position; (4) positive shut-off, line pressure provides leakproof seal, and (5) visual indicator, position of shut-off lever indicates whether valve is closed or open.

Intercommunication Control

A VOICELESS intercommunication control known as Temporator has been announced by *Temporator Div., Simplex Time Recorder Co.*, 54 Lincoln St., Gardner, Mass. It is said to be designed to bring time, cost, employee, production, materials, inventory, and shipping under instant, complete, central control. The outstanding feature is fast operation. Up to 4000 messages per day, an average of one every 8 sec, may be transmitted directly to and from employees through one operator seated at a 6-unit central control board connected with any number of substation dispatchers. Speed is attained through visible signal dialing, and communications are dialed the same as a dial telephone is used. This control is adapted in whole or in part to any size organization and to any situation where essential data must be quickly assembled. A combination of symbols delivers any desired directive or report. Symbols are flashed upon

and are visible simultaneously at both central control board and any designated substation dispatcher.

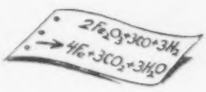
Breathing Apparatus

THE M.S.A. Chemox oxygen breathing apparatus has been announced by *Mine Safety Appliances Co.*, 230 N. Braddock Ave., Pittsburgh 8. This apparatus is said to generate its own oxygen and gives the wearer 1 hr protection in unbreathable air.

WHEN

THE JOB IS BRIGHT ANNEALING LOW-CARBON WIRE

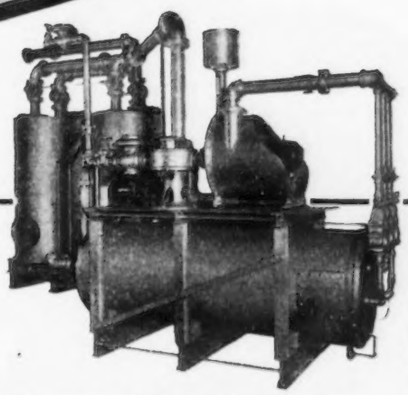
REDUCING VARIOUS METALLIC OXIDE POWDERS



TREATING SPRING STEEL IN DRY NON-DECARBURIZING GAS

THEN

KEMP "atmos-gas" fits



AT ONE OF OHIO'S LARGEST STEEL MILLS

. . . this KEMP "atmos-gas" producer guards low-carbon steel from the effects of both oxygen and water vapor—throughout a full 72-hr. bright-annealing cycle. It supplies enough protective atmosphere (15,000 cu. ft. per hr.) to keep up with 15 or 20 sheet-annealing bases. Operating at 6:1 air-gas ratio, and equipped with generous silica gel desiccating towers (left rear), it produces the analysis: N_2—72%, CO_2—5.8%, H_2—12.1%, CO—9.8%, CH_4—0.2%, O_2—none—dried to a dew point of—40°F.

And the reason is clear-cut. KEMP "atmos-gas" units are designed to suit the particular requirements of the particular process.

For example, high-carbon steels are touchy. Too much CO_2 or too much water vapor may cause decarb or scaling during the annealing cycle. In such cases, KEMP "atmos-gas" units incorporate amine scrubbers for CO_2 absorption, and silica-gel towers to desiccate the output.

For treating copper and brass, "atmos-gas" in the low CO range is preferred. The reduction of metallic powders requires quite the opposite.

Where fuel-gas might be "sour", copper gauze strips sulfur from the atmosphere gas.

It all depends on *your* products and *your* processes. KEMP engineers can tell you where you stand in the confusion of claim and counterclaim in this fast-developing business of atmosphere heat treating.

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PRECISION CARBURETION + ADAPTED COMBUSTION FOR INDUSTRY'S HEAT-USING PROCESSES
ATMOSPHERE GENERATION & ADSORPTIVE DRYER SYSTEMS FOR PROCESS CONTROL AND PROTECTION

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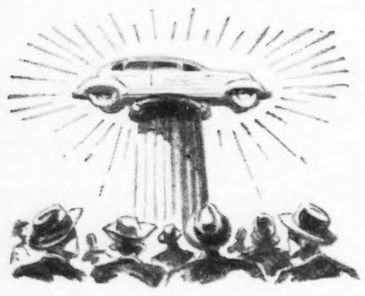
NAME_____
POSITION_____
COMPANY_____
PLACE_____

Assembly Line . . .

STANLEY H. BRAMS

• Studebaker displays its 1947 models, really a postwar automobile of notable lines . . . Board of UAW continues its feud and arrives at a policy which bodes no good for management.



CHICAGO—The automobile industry had its eyes trained on this city last week. Studebaker took the wraps off its 1947 models, and the United Automobile Workers Union executive board continued the Addes - Reuther feud which flamed to fever height at Atlantic City. Enough said.

While the new Studebaker cannot be described until it is formally introduced to the general public next month, it can be said here that the car is a beauty. It is truly a postwar car, and demand for it should be at fever pitch once it is displayed in the salesrooms. Dealers who looked at the line for the first time last week immediately intensified their already heavy pressure on the factory for deliveries, and the rate of 25,000 assemblies per month which Studebaker expects to reach on cars and trucks by the end of June will likely be little enough to meet the demands of the retail outlets.

Price applications are in at OPA for the new models and a good guess would be that the quotations will be somewhere between $100 and $200 higher than have prevailed heretofore for these lines. As one Studebaker official put it, any price increase of reasonable proportions should allow the company to balance in part its higher operating expenses.

Paul G. Hoffman, president of Studebaker, attributed the early start on 1947 models to four major circumstances—the pretermination agreement on war contracts which his company pioneered and which permitted quick clearance of plants after the war ended, decision made two years ago to concentrate engineering and development facilities on an entirely new car, harmonious labor relations, and the availability of the Studebaker proving grounds.

While these tidings were being welcomed by the Studebaker dealer organization from the Middle West, down the street a mile or so UAW was stirring a bitter broth for management in general. Coming out of its 2-week meeting, at which the Reuther forces fought to a draw with the anti-Reutherites, was a policy statement which bodes little good for future harmonious labor relations. The first fruit of this program began to bloom late in the week when the union rattled a strike threat at Chrysler Corp. on the claim that the company was retiring men of 65 yr and older.

Declaration that the UAW would strike its 65,000 Chrysler members was made in company with a declaration that a pension program for older automobile workers was henceforth a part of long-range policy. It was maintained that social security benefits as now scheduled have become obsolete and insufficient in the light of higher living cost, and that the only answer is a retirement fund program which, of course, the union wishes the companies to set up.

THIS is just one phase of the new UAW program. Another of considerable interest calls for a most intensive organizing campaign by the competitive shops department, whose function it is to see that the highest wage standards are not undermined by lower pay levels in unorganized plants, in so-called "run-away" plants, or in organized plants so far away from the orbit of top wage scales that they are not greatly affected by them. Former president R. J. Thomas, now a vice-president of the UAW, was assigned a staff of 24 organizers to go out and beat the bushes to bring the lower pay shops into line and thus prevent any undermining of work and jobs in the already organized plants. At the same time the union set up a plank in its forthcoming platform which called for the equalization of skilled trades rates in captive and jobbing shops alike at the highest pay levels—inferring that the captive shops will be the objective of a drive to

YESTERDAY'S HORSELESS CARRIAGES: *Reminiscent of the days when the horseless carriage was a novelty is this scene at Franklin Village near Detroit. A turnout of early model automobiles was held in connection with the Automotive Golden Jubilee preview. Car in the lead is an 1899 Packard and oldest car in the line.*

5 WAYS MAN-AU-TROL INCREASES VERTICAL TURRET LATHE PRODUCTION

Without losing any of its versatility of manual operation, the Bullard MAN-AU-TROL Vertical Turret Lathe . . . in automatic operation . . . steps up output for 5 reasons.

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2. It is set up for maximum productivity . . . assuring continuous operation at maximum practical feeds and speeds.

3. The machine eliminates the elements of fatigue and human error.

4. Its turret head permits standard simplified multiple tooling for simultaneous cutting not possible with other types of Vertical Turret Lathes.

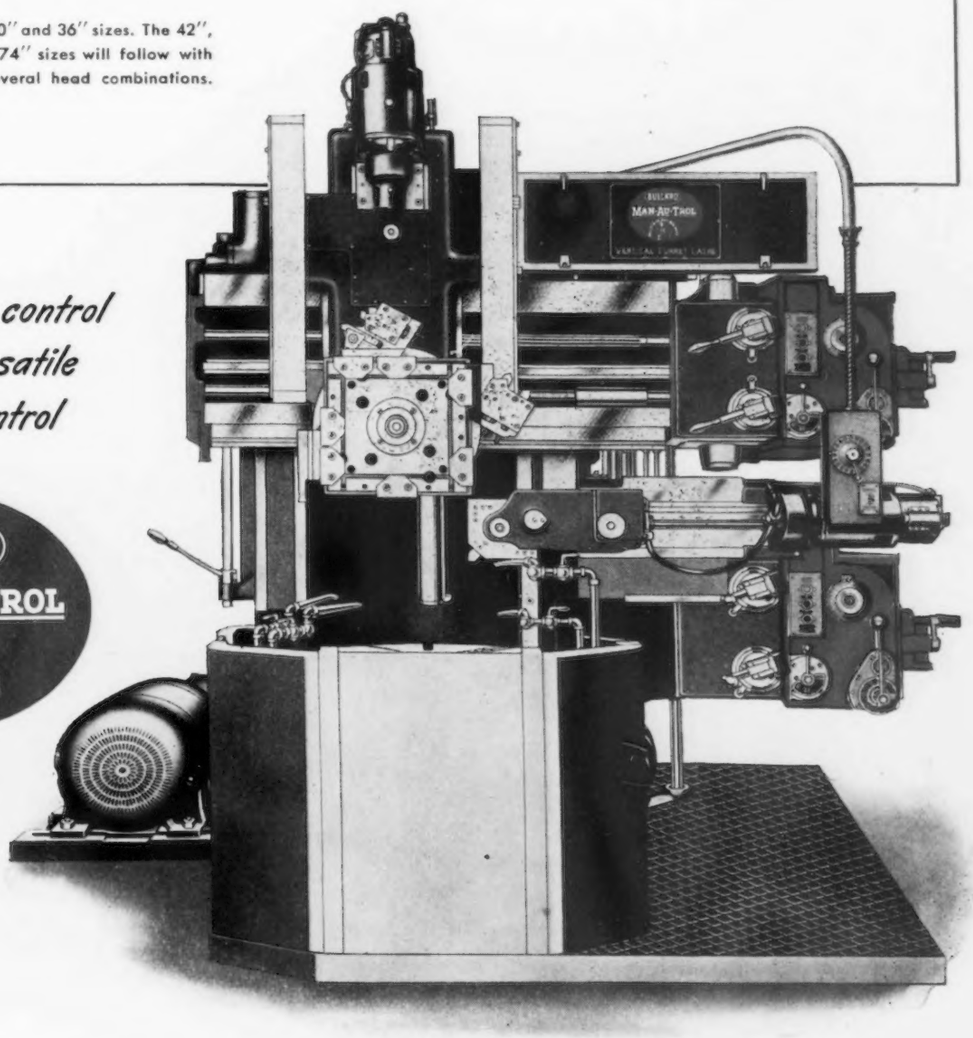
5. It consistently works to a degree of accuracy not obtainable with manually-operated machines . . . work spoilage practically eliminated.

For full details about the unique productivity, flexibility and accuracy of Bullard MAN-AU-TROL Vertical Turret Lathes, write for your free copy of Bulletin MAV-G-1 today. The Bullard Company, Bridgeport 2, Connecticut.

Now made in 30" and 36" sizes. The 42", 54", 64" and 74" sizes will follow with selection of several head combinations.

The automatic control that is as versatile as manual control

BULLARD MAN-AU-TROL MASTER OF THE MACHINE



BULLARD CREATES ***NEW METHODS*** TO MAKE MACHINES DO MORE

achieve the $1.84 average rate being paid in the Detroit tool and die shops as a result of the recent 20c. raise agreement.

Wage rates henceforth will be eliminated as a part of contract negotiations, if the UAW has its way. Wage schedules will be set up as an entirely separate negotiation, and efforts will be made to have all such agreements expire throughout the industry on a uniform date. This is obviously a preliminary step toward attempts to organize the entire automotive industry, or others, on a panorama basis which would eliminate any differentials between plants or cities. Apparently, the plan is aimed at washing out the large number of incentive pay programs which still exist in spite of the avowed opposition of the union to them. However—if this be any consolation for many companies — the union policy statement, taking a large slap at Walter Reuther's General Motors strike strategy and program, said that profit positions of individual companies had nothing to do with pay rates.

WITH respect to labor-management relationships, the superintendent of labor relations of Ford Motor Co., Mel B. Lindquist had some rather provocative remarks to make on the subject last week in a meeting of the Pittsburgh section of the Society of Automotive Engineers. Mr. Lindquist said:

"We were disappointed with the union's unwillingness to accept the kind of responsibility it might have displayed with regard to company security. We do not believe that the union can continue to avoid full and complete responsibility for wildcat or unauthorized stoppages. If we sign a contract with the union and the union under national law represents all its members, and if some of the members then violate the contract—if this happens, of what use is the contract, and where is the authority of the union officials who signed it?

". . . It is not my business to tell the union how to run its affairs. But I think I can say that their negotiators do not always have the kind of authority they need in order to reach firm decisions. For example, the UAW usually holds its elections once a year. This means that for an appreciable part of every year highly placed union executives have to think about these elections. The union contends that this system makes for union democracy, and we are certainly all for that. But it is sometimes difficult to carry on negotiations effectively when the national and local unions are likely to change officers, shop committeemen, procedures and negotiators every 12 months—and sometimes policy too. I do not wish to overemphasize this point, or to dwell on it. But this situation, viewed from the management side of the table, has caused problems."

Bobbi Motor Car Corp. Buys West Coast Plant

Washington

• • • **The Bobbi Motor Car** Corp. has purchased the war plant operated at San Diego by Consolidated-Vultee at a sales price of $1,600,000, it has been announced by War Assets Administration. Previously used as a sub-assembly plant for Liberator bomber parts, it will be converted to production of small automobiles with employment of 10,000 persons anticipated.

Announcement has also been made by WAA of lease to its wartime operator, Bellanca Aircraft Corp., of the New Castle, Del., gun turret plant for a period of one year. WAA said the Bellanca firm will use the facilities to make airplanes. Other recent plant disposals include the following:

To Allis-Chalmers Mfg. Co., the Milwaukee plant it operated for testing of jet propulsion units, the future use to be approved by WAA, on lease for one year with option for an additional two years.

Sold to M. B. Mfg. Co., two New Haven, Conn., aircraft engine parts plants it operated during the war; it will make machinery and parts.

Sold to Ingalls Shipbuilding Corp. government-owned facilities supplementary to its own plant at Decatur, Ala. It will make steel barges.

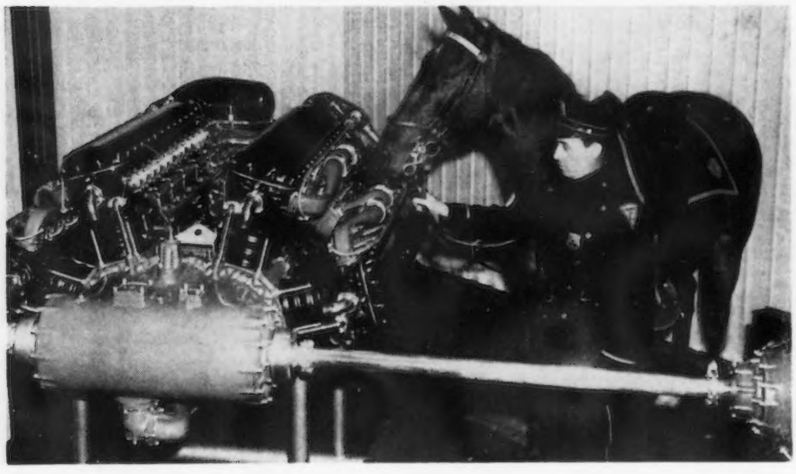
Reports First Quarter

Pittsburgh

• • • **Jones & Laughlin** Steel Corp. announced a net income of $813,246 for the quarter ended Mar. 31, 1946, as compared with $2,013,489 for the same period in 1945. The company transferred $4,000,000 from its reserve for contingencies account to the income account during the first quarter of 1946 because of the extraordinary expenses incurred as a result of the steel strike. Otherwise, the results for the quarter would have shown a loss.

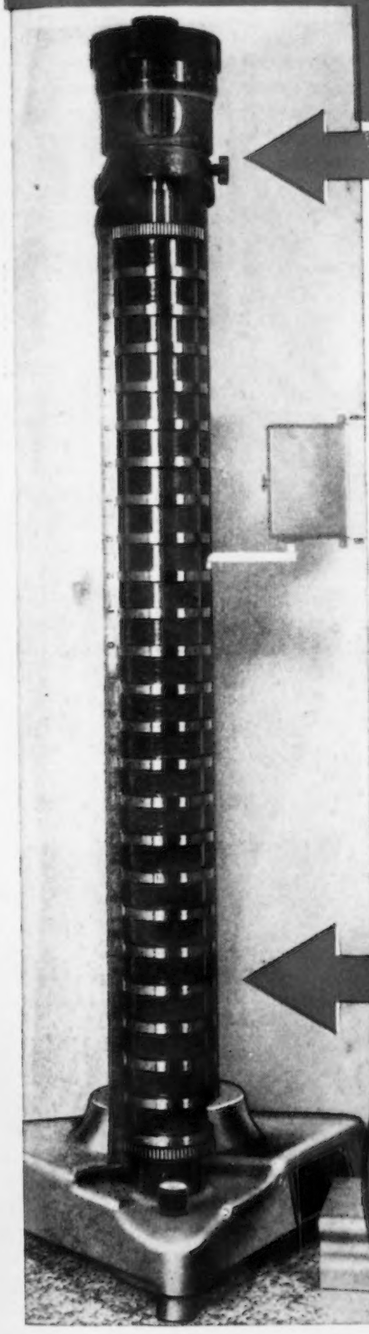
As the strike cost is a deductible expense for income tax purposes, and as the $4,000,000 transferred is not taxable income, no provision was required of J & L for income taxes during the first quarter of 1946. Provisions for $166,100 for federal income taxes shown in the statement were for certain subsidiary companies.

3001 HORSES: *Fantan, famous New York City police horse, doesn't seem awed by the Allison aircraft engine which packs* 3000 *times the power of a horse. The ton-plus engine develops* 3000 *hp and will drive a plane at more than* 400 *mph through a drive shaft arrangement that permits the engine to be submerged in the fuselage with propellers mounted in the wings.*



SETTING TIME: 10 SECONDS! ACCURACY: .0001" in 24"!

Cadillac PLA-CHEK SPEEDS CLOSE TOLERANCES DEMANDED BY POST WAR JOBS



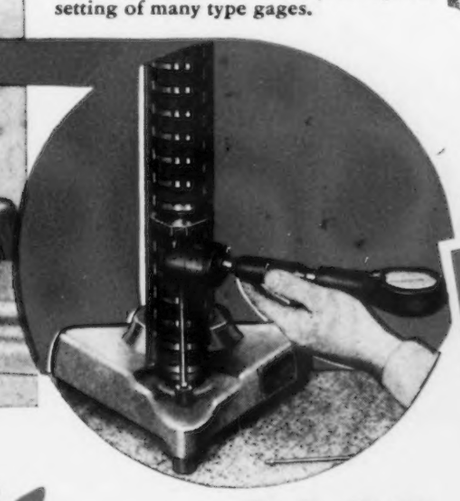
● Get This New 24" Model PLA-CHEK for FASTER . . . MORE ACCURATE INSPECTION.

PLA-CHEK is *guaranteed* accurate to .0001" in 24". An adjustable measuring bar with an endless scale graduated from zero to 24 inches each way establishes the minute tolerances demanded today . . . quickly, easily, accurately. The micrometer thimble graduated *plus* or *minus* enables the user to check *up* and *down* from the center line of work

A reverse checking plate may be quickly and easily clipped to any one-inch step on the Pla-Chek bar. The lower measuring flange is set even with the lapped button with the micrometer thimble set at zero. Inside micrometers, telescoping gages, or internal cylinder gages can be set directly between the button and the reverse checking plate by merely setting the micrometer thimble to desired dimension.

MICROMETER THIMBLE—Arrow indicates 1" of measuring sleeve travel in addition to 1" of micrometer travel. This enables user to measure directly from center or reference line of job.

REVERSE CHECKING PLATE—Speeds setting of many type gages.



Body heat does not affect the findings of Pla-Chek. There is no contact between the inspector's hands and the measuring bar. Speed your postwar inspections with this new Pla-Chek . . . the astounding new gage for surface plate work.

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See how much time PLA-CHEK will save you. We will be glad to send it on two-weeks free trial. If this trial satisfies you, send your check. If not, return PLA-CHEK express collect and you owe us nothing. Write, Wire, or Telephone. Reverse the Charges! Telephone: PRospect 1644.

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Washington . . . L. W. MOFFETT

• Huge mass of reports on Axis technical secrets being prepared by Dept. of Commerce for American industry . . . Considered as reparations.

WASHINGTON—The task of making known to American industry the scientific findings based on United States sponsored war research, plus the distribution of German and Japanese technical and industrial secrets, has saddled the Dept. of Commerce with one of the biggest publishing jobs of all time.

In the Department this work is centered in the Office of Technical and Scientific Services, under the direction of John C. Green. During the war Mr. Green served as chief engineer for the National Inventors Council, an organization headed by Dr. Charles F. Kettering.

Under this overall office are several subdivisions. Each of these is responsible for a particular phase of the work necessary to making available this vast storehouse of information.

Perhaps the most important of these subdivisions is the Technical Industrial Intelligence Service, which is the collecting mechanism, especially with respect to the vast masses of data still buried in Germany and Japan. This branch is modeled on and contains the same key personnel as the Technical Industrial Intelligence Committee which carried out the initial phases of German exploitation under the Joint Chiefs of Staff, but was financially sponsored by the Foreign Economic Administration.

The Office of Declassification and Technical Services is the processing and disseminating mechanism for the tens of thousands of miscellaneous documents being received and expected in the future. These documents are in German, Japanese and English. Each of them is examined, and an intelligent abstract is prepared in English, which is classified by industry and indexed by subject matter.

These abstracts are incorporated in a weekly bibliography by the Office of the Publication Board. Subscriptions to this bibliography are being accepted by the Superintendent of Documents for an advance payment of $10, which is subject to future adjustment, depending on the cost of publication. The bibliography is expected to grow until at full-scale operation there will be between 200 and 300 pages of new and valuable digested information available each week.

Each report is listed in the bibliography by subject and author. Each listing includes an abstract of the report and its price, so that the reports may be ordered immediately. Some reports are mimeographed, while other are in photostat or microfilm form. They range in price from 10¢ to $24, and are sold at the cost of making duplicates in the most inexpensive fashion.

The importance of these reports should not be underestimated, for as clearly stated by Mr. Green: "It is becoming more apparent that the only permanent and valuable reparations that can be obtained from the prostrate Axis nations will be their scientific and technical attainments which added to our own will keep us in advance in the peacetime race for scientific supremacy."

That industry is interested is evidenced by the fact that since its inception last fall the Office of the Publication Board has distributed 189,000 copies of approximately 3000 technical reports that have been released, resulting in a cash return to the Treasury of more than $20,000. Reports are now being sold at the rate of 4000 a week, with more than 10,000 new reports awaiting release. It is expected that more than $700,000 will be realized from the sale of reports for the fiscal year beginning July 1.

The greatest benefit expected to be derived from Germany is from their chemical processes and techniques. However, significant developments have been uncovered in machine tools and metallurgy.

Included among the developments discovered in German plants are: A method of cold extruding steel which could produce shell fuses at a rate of 20 to 30 a min, almost ten times the rate achieved in other countries; a 12,000-ton extrusion press; a profile machine which can use almost unskilled labor and draws the actual contours and profiles on a microscopic scale with tolerances that engineers have termed practical; and a method for artificial production of quartz crystals.

In addition to the spade work accomplished by Army officers following on the heels of the liberating armies, more than 500 scientists and industrial experts have already worked in Germany bringing vast amounts of material to light. But hundreds of tons of documents still remain to be worked over.

The work in Japan is just beginning, but significant developments in radio have been uncovered, and much work remains to be done.

Officials are now trying to work out a plan for interchange of information with other countries. A few investigators have been working in France and in the Russian occupation zone in Germany.

Commerce has requested funds for 242 field positions in Europe for the Technical Industrial Intelligence Service, plus 11 field positions in Japan. The overseas job should be completed by December 1947, and the entire operation is expected to be wound up by June 30, 1948.

However, the work is handicapped by a shortage of trained personnel to carry on the field investigations. Mr. Green recently appealed to industry for the loan of qualified technicians in the major industrial fields for a minimum period of six months. This type of cooperation is necessary if the job is to be completed within the scheduled time limit. Routine work will be

Announcement

TWO ADDITIONAL SIZES OF FILMATIC PLAIN HYDRAULIC GRINDING MACHINES HAVE BEEN ADDED TO THE CINCINNATI LINE

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These machines have many outstanding and exclusive advantages which give them distinctive qualifications for grinding precision cylindrical work. They fill the need existing in many shops for center-type grinders capable of rapidly producing exceptionally fine finishes and close tolerances of accuracy in a routine manner and on any production basis. Because of their easy and quick manipulation features, and the wide selection of attachments which are available, they may be used for toolroom lots or high production work, for traverse grinding and infeed grinding.

If you would like to know more about the features of these new machines, write for descriptive literature as indicated under the illustrations

CINCINNATI FILMATIC 10"-L Plain Hydraulic Grinding Machine. Write for publication No. G-537 which contains complete information.

CINCINNATI FILMATIC 14"-L Plain Hydraulic Grinding Machine. Complete details may be obtained by writing for publication No. G-533

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TYPE GRINDING MACHINES • CENTERLESS GRINDING MACHINES • CENTERLESS LAPPING MACHINES

done by German civilians but qualified technicians are indispensable for the job of supervision and selection.

In addition, the OPB has requested industries, scientific groups, and technical journals to suggest specific information that should be sought, to serve as a guide in directing the work of the men who are examining German documents. OPB says that it would be helpful to have any suggestions as to where valuable documents might be found, and what industries might possess information not now available.

Any industry or scientific group interested in specific German industrial methods and able to assign personnel to visit Germany should make this known to OPB, and if the project appears to be of probable value to American industry, the necessary arrangements will be made.

The following step-by-step outline of the manner in which a typical investigation is carried out illustrates clearly not only the job that is being done now, but the job that still remains to be done in many instances if all the available material is to be used to the best possible advantage:

(1) Government agencies or private industry groups indicate the probability that German or Japanese technology in their field would bear investigation and request that this be undertaken.

(2) This request is evaluated in the light of previous or current investigations, collateral requests for information, technical value and available substantiating evidence.

(3) Investigators are nominated by government agencies or recruited from industry.

(4) Their technical qualifications are verified by checking with competent authorities in government and industry. Their personal qualifications are verified by checking their personal and business reputations, habits, and relationships with the FBI, Office of Naval Intelligence, G-2, and the Provost Marshal General of the Army. If these investigations are satisfactory, the State Dept. is requested to check with the commercial, geographic and political desks and with the Passport Div. files, to guard against cartel involvements, dubious political connections in foreign countries and previous undesirable behavior if the individual has been abroad before. (Editor's Note: If he gets through all this the OPB might decide to let him go.)

(5) The investigator is briefed as to the general subject of his investigation and is given some indication of the plants, factories, or laboratories that he might visit, personnel that he might interview, and centers where pertinent documents might be found.

(6) The investigator is dispatched overseas where his briefing is brought up to date in the light of more recent information and he is assigned as the senior member or coleader of a team consisting of one or more technically qualified investigators like himself, a microfilm operator with a portable outfit, a driver and one or two clerical assistants, if necessary.

(7) The team maps out an itinerary to cover one or several plants in their field and proceeds to the first of these.

(8) If previous assessment has revealed that the plant to be visited contains documents that should be screened, that personnel is available which should be questioned, and that certain items of material are under guard or concealed nearby, this information (as a part of their last briefing) is used to initiate and organize the investigation. Technical documents of interest are separated from routine administration, financial and other documents and technical documents are sifted or screened to eliminate those which refer to processes already known in this country or of only limited interest.

(9) The profitable residue is microfilmed.

(10) The microfilm reels from the field are assembled and correlated with other related information from other plants and then edited.

(11) In the process of editing cards are made up showing the subject matter contained in each reel with brief descriptions and notations. These cards are made in triplicate, one copy remaining in the field, one copy accompanies the reels, and a third copy is forwarded separately.

(12) The microfilm reels and any accompanying reports are forwarded to Washington for dissemination to government agencies and industry.

THE BULL OF THE WOODS — BY J. R. WILLIAMS

MY OLD DRILL PRESS WOULDN'T HAPPEN TO BE VACANT, WOULD IT?
HAH? I THOUGHT YOU GOT MARRIED AN' BOUGHT A HOME!
TH' BULL O' TH' WOODS ALLUS THOUGHT WOMAN'S PLACE WAS IN TH' HOME, AN' SINCE THEIR LITTLE SOJOURN HERE HE'S SURE OF IT!
THEY ALWAYS DID THINK MEN HAD TH' MOST FUN, AND I GUESS THEIR TOUR OF DUTY IN TH' SHOPS CONVINCED 'EM OF IT!
5-3 J.R.WILLIAMS
T. M. REG. U. S. PAT. OFF.
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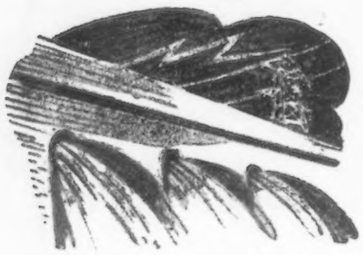
ROBERT T. REINHARDT

• Boeing production slows down because of material shortages . . . Spokane anticipates early operation of aluminum plants . . . New refractory brick plant in production.



SEATTLE — Production schedules established by Boeing Aircraft Co. on its Stratocruisers, for which a backlog of more than $126 million in orders is on the books, have had to be drastically altered because of shortages of steel and aluminum.

Inability of the Aluminum Co. of America to make scheduled deliveries of 75-S aluminum alloy sheets and shortages of various grades of steel have already made it necessary to lay off approximately 500 employees, it is reported. About half of these workers had been employed in the Renton plant which has just completed work on the last of the B-29's and were to have been absorbed in the Seattle operation. Alcoa is the only producer of the new 75-S alloy which is credited by Boeing engineers with enabling them to design lighter and stronger wing sections.

Many of the materials now holding up production were ordered for delivery last December according to plant officials. Firm mill commitments are again being made by suppliers but with deliveries so far in the future that production of all aircraft is being curtailed. Last month Boeing officials optimistically reported that the company hoped to have 12,000 employees by late spring, but with present material difficulties it is doubtful if the payroll can be maintained at the present total of approximately 9000.

If the experience of the municipal civil service commission is any criterion there is no need for unemployment in the city of Seattle. According to Roy Palm, executive city secretary for the commission, 400 vacancies in the laborer's civil service list are going begging. Repeated calls for applicants have produced only a fraction of the number of men needed. These jobs call for a 40-hr week and carry pension rights and 12 days vacation a year. Construction men maintain they have encountered the same antipathy toward heavy work and that because of the scarcity of labor the general building trend has been slowed down.

SPOKANE—Although not officially confirmed by the Kaiser interests, it is generally understood in this area that both the Mead aluminum reduction plant and the Trentwood aluminum rolling mill are scheduled to get into production in June with D. A. Rhoades of the Permanente Metals Corp. in charge of operations. Mr. Rhoades has been project manager of the carbothermic magnesium plant in California which, during the war, produced both magnesium ingots and magnesium dust used in incendiary bombs.

Apparently the operations of the aluminum plants will be in the name of TPMPC under the leases granted Kaiser Cargo, Inc., and Kaiser-Frazer Corp., with John R. Meek, works manager of the rolling mill and Norman L. Krey of Maseena, N. Y., in charge at the reduction plant.

Personnel men of the Henry J. Kaiser interests have been active in the area for the past few weeks lining up prospective employees, many of whom formerly worked in the two plants under the direction of Alcoa.

What effect, if any, the recently announced discovery of alumina clay in this area will have in plans for operating the local plants is not as yet known. Reportedly carrying approximately 29 pct alumina the local deposits compare unfavorably with those in the Portland area said to run about 35 pct alumina and with the Arkansas bauxites which run around 55 pct alumina. However, elimination of shipping costs and the possible recovery of byproducts may make development of the local deposits economical. The Kaiser interests already have a source of alumina in the Baton Rouge, La., plant which was recently leased by them from the War Assets Administration.

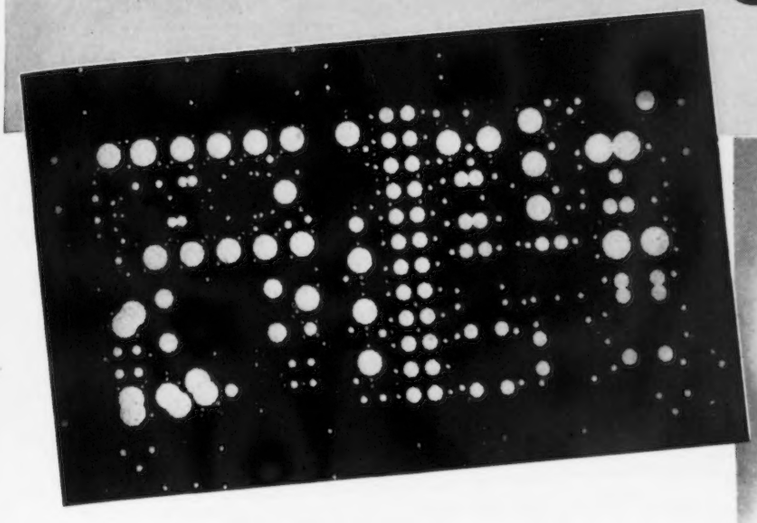
While Henry J. Kaiser announced some time ago that the aluminum sheets produced at Trentwood would be used in the bodies of Kaiser and Frazer automobiles, there have been reports from the East that preliminary negotiations with other consumers of aluminum sheets have been underway, indicating that at least part of Trentwood's production will flow into competitive channels.

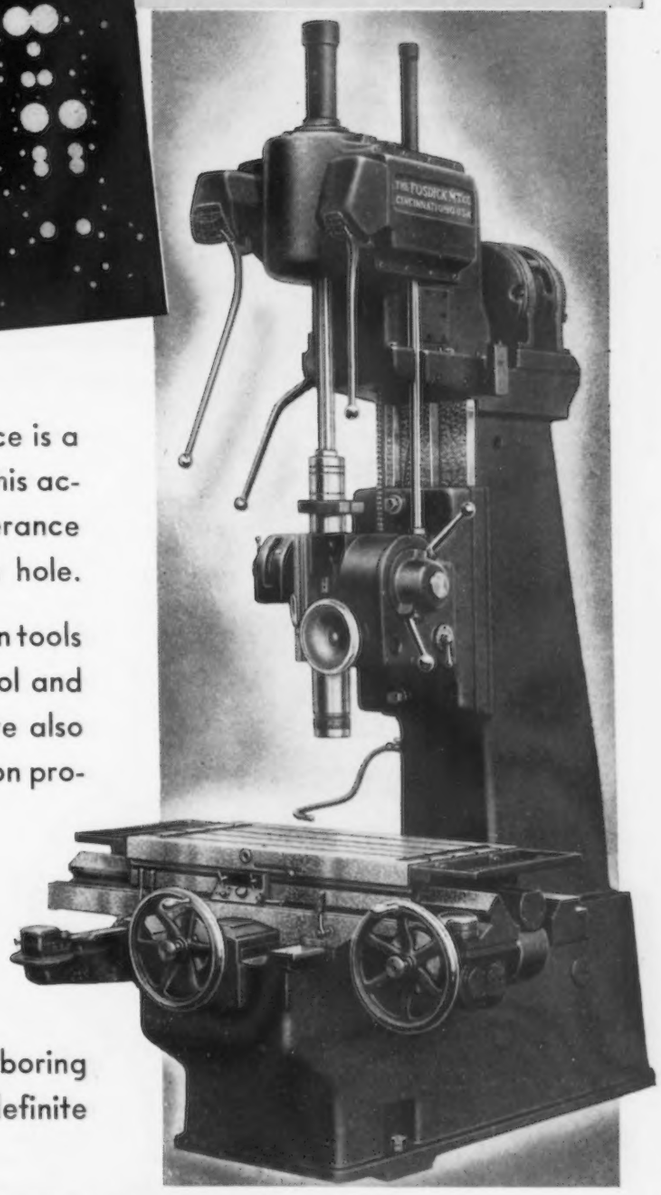
One of the largest users of aluminum sheets in the Northwest—Brown Industries of this city—is engaged in an expansion program which involves an assembly unit for aluminum semi-trailers, three-axle full trailers, single-axle trailers of various lengths and truck bodies at Van Nuys, Calif. Sales and service units are also being established in Los Angeles and Denver.

A pioneer in aluminum fabrication, Brown Industries made aluminum bus bodies in 1934 and before that the founder of the company, William Brown, experimented with aluminum in mine cars and duck boats. He was also credited with having built three airplanes similar to the Japanese Zero as long ago as 1928. Since the death of the founder the business has been operated by two sons, W. R. and T. C. Brown, who have

385 Holes held to .0002" tolerance on a

FOSDICK Jig Borer





● The drilling of 385 holes in a work piece is a good sized order in itself. Not only was this accomplished on a Fosdick Jig Borer but a tolerance of .0002 inch was maintained on each hole.

Fosdick Jig Borers are essentially precision tools designed primarily for tool room and tool and die shop operations. However they have also proved both successful and economical on production work requiring exceptional accuracy. This is particularly true of runs which would not warrant an investment in costly jigs and fixtures.

The flexibility of the machine adapts it to a wide range of drilling, reaming, boring and even light milling operations to definite precision tolerances.

For complete construction details and operation data write for Fosdick Jig Borer Bulletin J. B. I.

FOSDICK MACHINE TOOL COMPANY
CINCINNATI 23, ··· OHIO

concentrated on trucks and trailers with aluminum bodies and magnesium parts. The latest development of the company is the 34-ft tandem axle semi-trailer being assembled here and at Van Nuys.

Raw materials are fabricated into sub-assemblies here and shipped to the Van Nuys plant for completion of the work. A schedule of 25 units per month has been set for the California plant. It is anticipated that as soon as materials become more abundant most of the work will be handled in the California plant on units to be distributed from there. E. A. Brownell is general manager of the California operation which is known as Brown Industries, California Div. Mr. Brownell formerly was employed at the Boeing Aircraft Co. plant in Seattle where he had 10 yr of experience in fabrication of airplane assemblies and parts. Roy Leffingwell is general manager of the sales and distribution of trucks and trailers in California, Arizona and Nevada through the Los Angeles office.

R. A. McLachlan is general manager of the Denver sales and service branch to which units will be shipped complete for distribution. He was formerly at the local plant and previously was with the Northern Pacific Railroad Co.

Through Olson & Sons, Brown Industries products will be distributed in the Minneapolis area and negotiations are under way for setting up distribution and service centers in Seattle and Tacoma, Wash., and in Portland, Ore.

The 150,000 residents of this city were getting back into the habit of walking a few blocks or hailing a taxi as 300 bus drivers and repairmen voted to remain in a "mass meeting" until the National City Lines Co. acceded to demands of the AFL union to change its group insurance plan so that its benefits would not be lost by employees after they leave the company.

SAN FRANCISCO—Production of basic refractory brick is getting started at the new plant of the Permanente Products Co. at Moss Landing, Calif. For the past two years basic refractories have been made at a pilot plant of the company near Milpitas, Calif., which utilized the periclase produced from sea water and dolomite in the kilns of the Permanente Metals Corp. as the basis of the product. The bricks so made were used in the kilns of the Permanente Cement Co. and in the open hearths of the steel plant of Kaiser Co., Inc., at Fontana, Calif. According to officials of the Kaiser interests which control all of these companies, the results were sufficiently encouraging to warrant production of the refractories on a commercial and competitive basis.

The periclase is screened to size and mixed with a binder and filler of exceptional fineness which results in a dense brick with a high magnesia content that retains its strength under extreme temperatures, it is said.

At present two four-mold International presses, each with a capacity of 100 tons of bricks per day, are in operation.

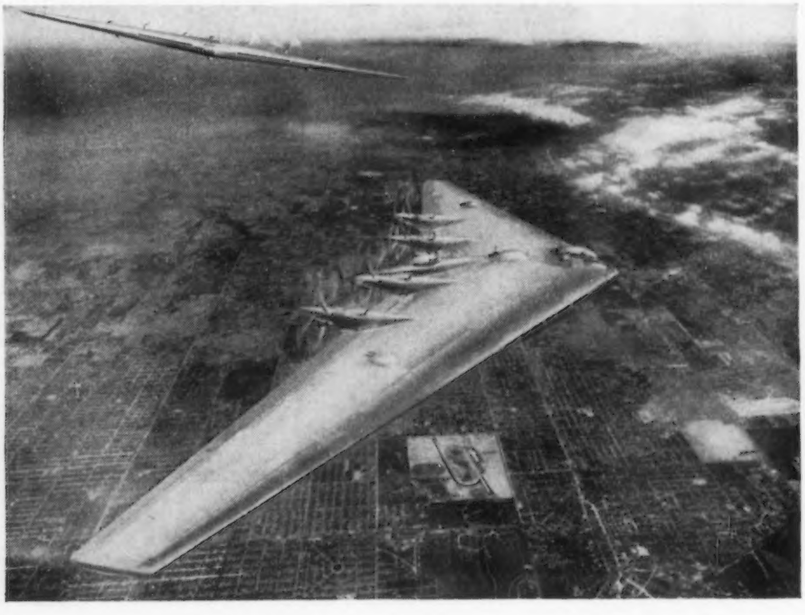
The Pacific Coast Engineering Co. of Alameda, Calif., has begun a $150,000 retooling and re-equipment program, according to C. H. Ramsden, president. Construction of gates for U. S. Bureau of Reclamation dams and large oil barges is keeping the plant busy at present and future business includes emphasis on building and servicing hydraulic dredges which have long been the principal activities. The entire re-tooling program is expected to cover a two-year period.

Just clearing the wire on building limitations the Earle M. Jorgensen Co., steel distributors of Oakland, Calif., is making good progress on the erection of an additional warehouse and office building to cost approximately $250,000 and to contain approximately 38,000 sq ft.

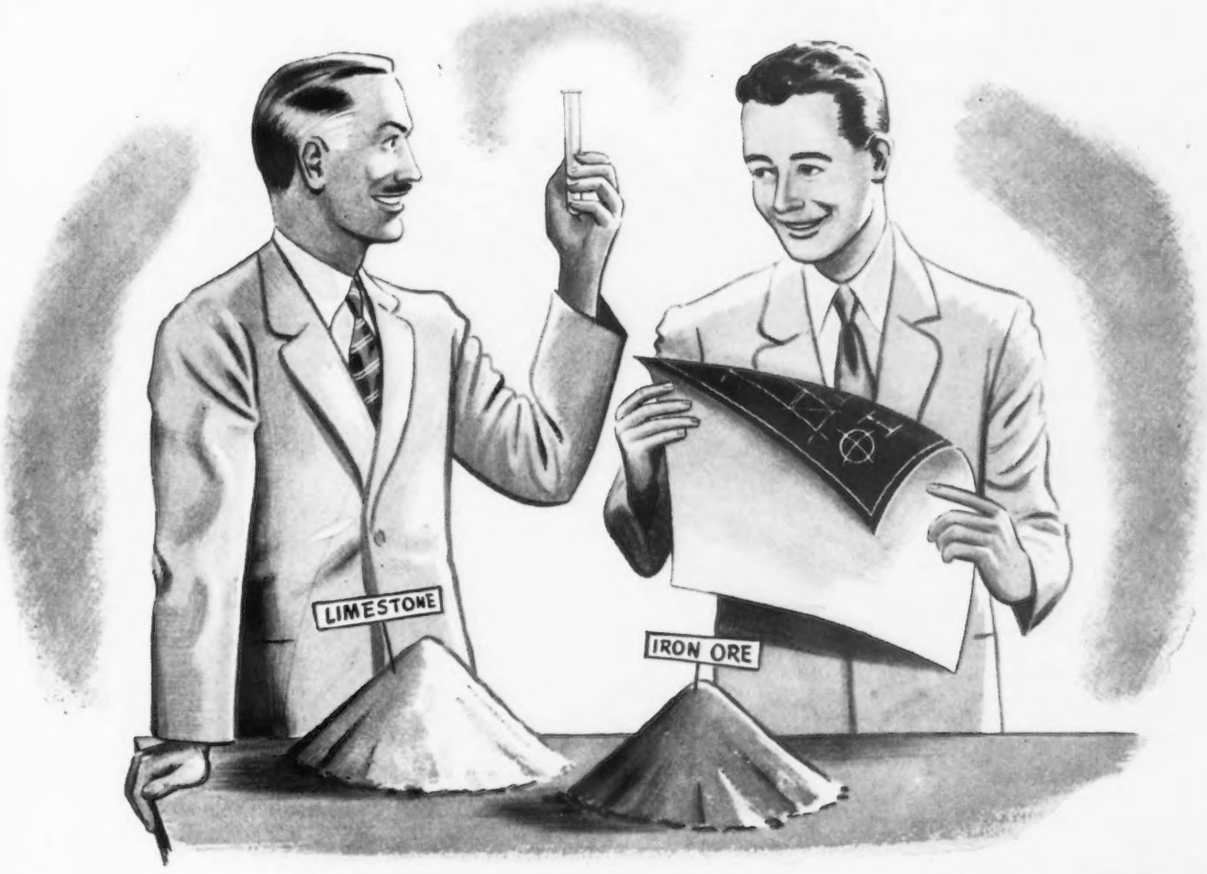
Industry has two serious strike threats to ponder this week as the P.G.&E. utility workers and longshoremen remain unappeased by their employers. When the P.G.&E. last week announced a 2½ pct pay raise for approximately 11,000 employees to meet a similar increase by its southern neighbor, the Southern California Edison Co., P.G.&E. was accused by the union of violating an agreement that neither side in the argument would disclose what transpired during negotiations. The company pointed out that this raise had nothing to do with the strike but that it was in line with policy to pay the same rates as other utilities in the state.

A three-man board appointed by the Secretary of Labor is looking into the longshoremen's complaint and in a series of hearings and field trips has amassed considerable data on the situation but no findings are as yet public information.

GIANT BOOMERANG: *Here is an artist's conception of the Northrop Flying Wing XB-35 bomber in flight over Los Angeles. Of revolutionary design it has no fuselage or tail surface and carries its engines in the submerged housing within the wing surfaces.*



They give steel a "physical" before it is born!



Before raw materials go into the open-hearth furnaces, all mill-orders for Armco sheet steels are given a complete Q.C.—(Quality Control) analysis. The steel must be *right*, physically and otherwise.

What kind of steel is needed? How much annealing? What special drawing or welding qualities does it need for the customer's requirements?

These and other questions are studied in the Armco laboratories. Answers are recorded on a routing card that accompanies your order of Armco steel all the way—from open-hearth furnace to shipping platform.

Data and instructions on this individual routing card represent the composite judgment of your engineers, and our metallurgists, chemists and operating men. It is the result of information you give our sales and mill representatives, and the blueprints you supply; of experience with previous orders or similar applications.

SPECIAL PURPOSE ★ ARMCO ★ SHEET STEELS

PRESCRIPTION: "Q.C."

Armco's mill supervisors call this prescription "Q.C."—Quality Control.

It all adds up to this: You get the *one right steel* for the products you make—and those who buy your products or equipment get full material value from their purchase.

This is why Armco is the leading producer of special-purpose sheet steels. Research, experience, advanced methods all contribute to "Quality Control" at our end and better quality at yours. The American Rolling Mill Co., 2611 Curtis St., Middletown, O.

Export: The Armco International Corporation

THE AMERICAN ROLLING MILL COMPANY

European Letter . . . JACK R. HIGHT

• Machine Tool Council formed as link between government and industry . . . Prohibits German research in all war related branches of science.

LONDON — To perpetuate the government liaison with the British machine tool industry which was established during the war, the Minister of Supply, John Wilmot, has appointed a nine-man Machine Tool Advisory Council. S. F. Steward, until recently Director General of Machine Tools in the Ministry of Supply, has been appointed chairman of the council.

The announcement follows a report made by the machine tool industry to the government which recommended the establishment of some permanent link between the government and the industry. There will also be a special machine tool department in the new Engineering Industries Div. of the Ministry. According to a speech made by the minister in announcing the names of the members of the council, it will be charged with the duty of "advising on measures necessary to promote and maintain an adequate and healthy British machine tool industry in the interests of our security and industrial efficiency."

The council is to be concerned with woodworking machine tools and testing machines, as well as with metalworking tools. It is intended to set up in the near future a similar council working closely with the machine tool council to deal with the tool and gage industries.

It will be the duty of the machine tool council to keep Britain's machine tool needs constantly under review and to advise on the whole question of these types of machine tools which are not at present manufactured in Britain, or of which the production is unduly limited. Other duties of the council will include advice on the collection and dissemination of essential statistics regarding the machine tool industry, on machine tool exports and imports, and on matters of research and development.

The operation of the British machine tool disposal system is also to be under surveillance by the council. The minister also suggested that important matters related to the future of the German machine tool industry would also be referred to it for assistance.

The members, appointed with the suggestions of the Machine Tool Trades Assn., are as follows:

W. P. Eastwood, chairman and managing director, George Swift & Sons, Ltd.

H. W. L. Kearns, chairman and managing director, H. V. Kearns & Co., Ltd.

G. S. Maginness, chairman and managing director, Churchill Machine Tool Co., Ltd.

R. D. G. Ryder, joint managing director, Thomas Ryder & Son, Ltd.

J. H. Goddard, chairman and governing director, Wadkin, Ltd.

J. B. S. Gabriel, chairman, Charles Churchill, Ltd.

W. G. Bass, director, Ferranti, Ltd.

Isaac Hayward, general secretary, National Union of Engineers, Firemen, Mechanics & Electrical Workers.

Mr. Bass and Mr. Hayward are classed as independent members, and will bring to the deliberations of the council the views of men outside the industry and the government.

On the government side, the Admiralty will be represented by H. C. Rogers, the deputy controller (production); Board of Trade by H. A. R. Binney, principal assistant secretary; and the Ministry of Supply by E. B. Bowyer, undersecretary (engineering), J. W. Blackshaw and H. J. Gloag of its machine tool dept.

Mr. Blackshaw and W. J. Morgan, secretary of the Machine Tool Trades Assn., will serve as joint secretaries.

The minister disclosed in his report that of 460,000 machine tools installed in British factories during war years, 380,000 of them were British built. During the same period, $92,000,000 worth of British machine tools were exported to other allies, including about $50,000,000 to Russia. From an industry which produced £6.5 million in metalworking machine tools in 1935, the British industry expanded to £16 million output in 1939 and to £43 million output in the peak year 1942.

* * *

The reduction of the controlled aluminum price to British consumers from about 15¢ per lb to about 11.6¢ at the present exchange rate is being welcomed by fabricators. Despite the greatly reduced costs of the war capacity developed in Canada, British consumers have been constantly fearful that their dependence upon imports of virgin metal would place them at the mercy of a high price.

The contracting for the purchase of over 200,000 tons for the remainder of 1946 and 1947 indicates that the new low price can be expected to be maintained for some time.

Price competition from the Aluminum Co. of Canada has forced the Swedish aluminum producers to ask their government for an increase in import duties, as they stated their costs to be 80 pct above those of the Canadian. According to their statements even when

ARMING Argentina!

London

• • • Asked what licenses had been issued for exports from Britain to the Argentine of airplanes, arms or other military equipment, H. A. Marquand, secretary of the Dept. of Overseas Trade, replied recently in the House of Commons that 13 had been issued since Oct. 1, 1945, for civilian aircraft or parts and "one license in respect of naval and military swords."

THESE PROBLEMS now solved, become simple

Experiments No. 512C and 613

Metallurgical Examination of 28% Chrome Weld Metal with Additions of Titanium and Columbium

Investigation of the Mechanical Properties of Martensitic Straight Chromium Weld Metals

Experiment 625

Metallurgical Investigation of Premature Creep Test Failure, Specimen No. 2-E-7

Many of the major advances in alloy welding come from the Arcos Research Department. A highly trained professional staff of physicists, chemists, and metallurgists is constantly at work on the problems of industry. The problems they solve are many and varied . . . a fabricator is guided to standardize on the proper electrode for a critical job . . . a specific metallurgical requirement is met . . . an electrode is developed for a new alloy steel . . . corrosion resistance of weld metals is constantly checked.

Arcos research means better alloy electrodes every day in the year. It means that you have a competent source of reliable information available for the solution of your particular welding or electrode problems.

Constant research on special problems as well as on Arcos standard electrodes means that Arcos trade-names CHROMEND (one of the lime-type coatings for DC) and STAINLEND (titania coating for AC-DC) may be specified with full confidence.

Successful alloy welding often depends on having complete, correct information. Here is a text book in wall chart form — the Arcos Reference Chart on Alloy Welding. A copy will be sent you on request.

WHEN YOU THINK OF ARCOS, THINK OF ACTIVE RESEARCH IN ALLOY WELDING

ARCOS

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freight rates are reduced and cheap foreign bauxite becomes available they expect to be able to reduce their costs only to 14 pct above the present Canadian selling price.

The representatives of the Canadian firm itself profess ignorance as to whether the big price cut announced in London will also be reflected in their prices in the rest of the world, but admit the "general significance" of the downward price trend.

The British press adds strength to the growing belief that Alcan's costs are far below any other world producer with the disclosure that it was through the initiation of the Canadian firm that the international aluminum cartel which had been inactive during the war was formally dissolved last year. The implication here is that the old airtight system of allocating markets would be too restrictive for the biggest and cheapest producer.

* * *

The final regulation covering the control of research in Germany is being drafted in Berlin, and will prohibit research in all war-related branches of science in Germany. Control plans include the elimination of all technical military research organizations and the strict policing of all university and industrial research organizations.

Applied research in nuclear physics which led to the development of the atom bomb in America is on the list of forbidden studies, as well as applied research on airplanes and their engines; rockets, jet, and gas turbine engines for aircraft; and ship construction and behavior.

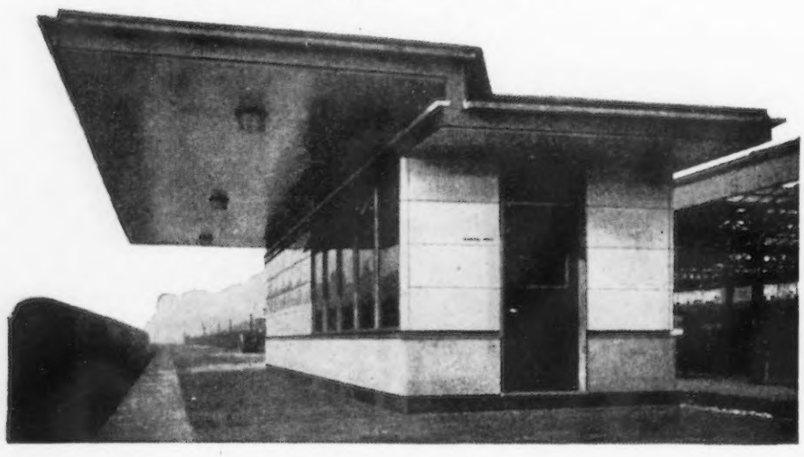
In addition to a list of forbidden subjects, the control plan as outlined will control through a licensing plan studies carried out in certain fields necessary to a peacetime economy but possibly adaptable to wartime use. Among the branches so covered are electronic studies for telephone and telegraph service, electron tubes, industrial explosives, radioactivity other than for medical purposes, and war chemicals such as chlorine that are also essential for peace.

The plan, which has been approved for application in the American zone, is now under discussion in Four Power meetings. It differentiates between fundamental research and applied or development studies, but groups them for control purposes under the Economics Div. of the military government. Fundamental research which is not of a direct military nature will be permitted, except when it results in the development of equipment which might possibly be used for war purposes.

All research projects in nonprohibited fields will be permitted subject to authorization by the zone commander. To prevent secret studies, all technical personnel working on any project are to be registered and regular reports to the research control will state the source of funds backing the project. Details of equipment being used and progress are also to be reported, and inspections are to be carried out to all projects by technical personnel.

The use of senior officials or scientists who have records of more than nominal participation in Nazi party activities is forbidden in any research projects, but work in the past on war weapons will not alone be regarded as barring an individual.

PUTTING UP AN ENAMELED FRONT: *L. M. S. Railway, England, has erected this experimental station building. Advantages claimed for the vitreous enameled panels include flexibility of construction, durability, low maintenance costs, resistance to acid and heat shock. Each panel has a normal ground coat, followed by two coats of light blue enamel on the outside face and one coat of black enamel on the reverse side.*



Semi-Continuous Strip Mill Built in France During German Stay

Paris

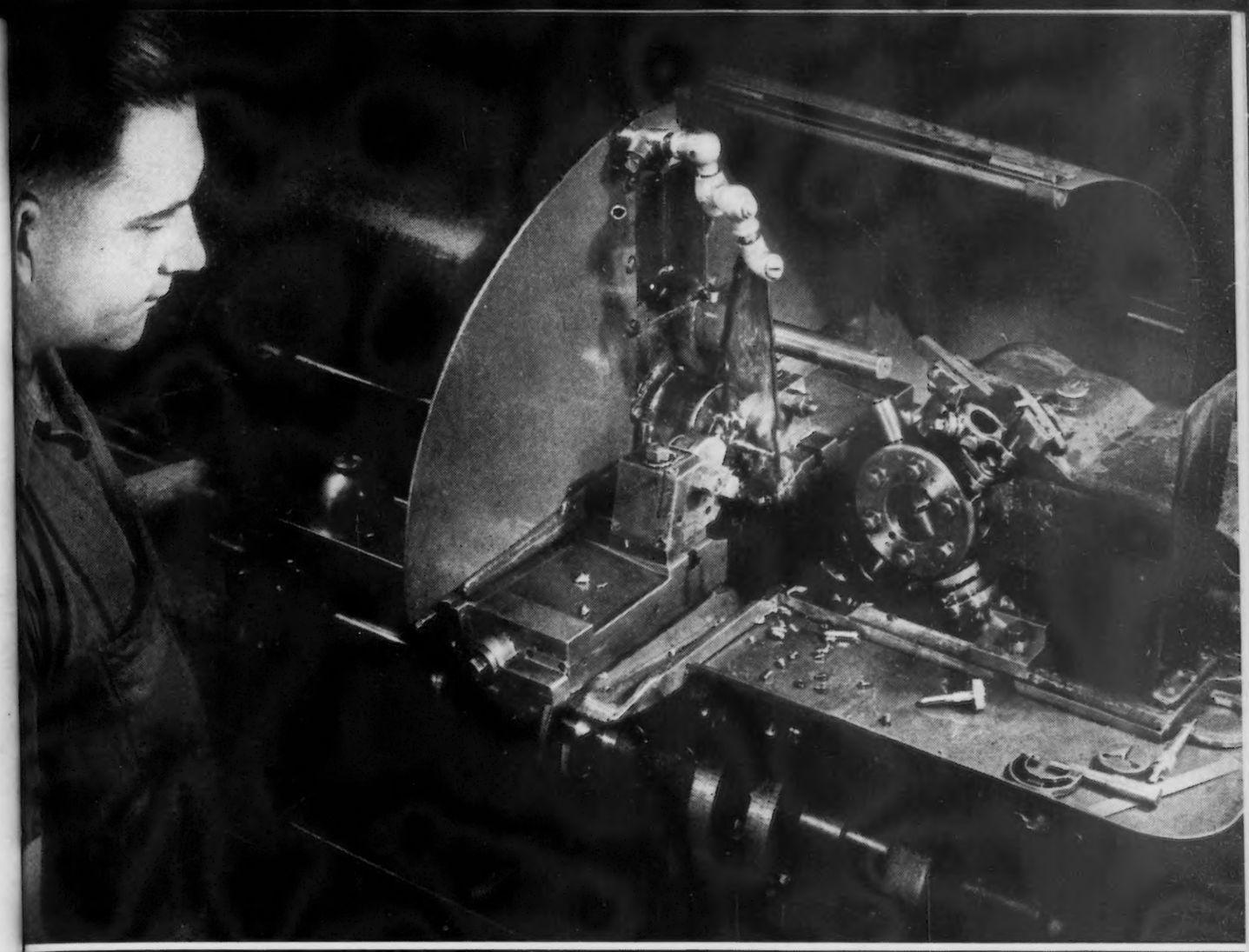
• • • **A new semi-continuous** type strip mill was built during the occupation by the Firminy Steelworks, and has been in intermittent use since 1942. It uses a standard reversing mill technique with the addition of special tools at each end upon which the strip winds to prevent heat dissipation.

The new mill was conceived as a result of a study by the firm to develop a mill for the economical production of sheet and strip in the comparatively small quantities required for the existing European market. Studies were undertaken for the project in 1935 in an effort to develop a single stand mill for strip of 600 mm. or larger.

The mill is understood to consist of a roughing stand which rolls an ingot of five tons of about 48 inches in width. Reductions are said to amount to about 2.9 in. per pass.

The billet then is conveyed to the finishing stand, a four-high mill with rolls of about 80 in. in width. The diameter of the backup rolls is 53 in. and that of the work rolls is about 43 in. The strip gets three flat passes in this stand, and then on the fourth, at about 0.98 in. thickness it is rolled on the special cylinders. From this moment it stays constantly on one or the other, alternating with each pass through the mill.

This mill handles strip up to 59 in. wide, and rolls in thicknesses down to 0.11 in. The weight of the strip is about 4500 kg, and production is reported to average about 25 to 30 tons per hr.



TOOL LIFE *Up 400%*

SUNICUT...

Increases Production from 75 to 380 Pieces per Grind

A manufacturer of automotive parts formerly obtained from 20 to 75 pieces between tool grinds and was troubled with high drill-breakage.

Changing to Sunicut, for a cutting lubricant, he was able to increase tool life more than four hundred per cent—to 380 pieces per grind.

This is a typical example of the way in which Sun Engineers lend a helping hand to the manufacturer who is striving for production . . . precision . . . and profits.

And Sun service is not limited to machine shops. Throughout industry . . . in steel mills, textile mills, chemical plants, power plants . . . in the processing of rubber, ink, leather, paint . . . the Sun trade-mark and the Sun Engineer stand for higher production at lower costs.

SUN OIL COMPANY • ***Philadelphia 3, Pa.***
Sponsors of the Sunoco News-Voice of the Air — Lowell Thomas

SUN
SUNOCO
INDUSTRIAL PRODUCTS

PERSONALS

ALBERT J. BROWNING, director of purchases, Ford Motor Co.

• **Albert J. Browning,** who has been recently organizing the office of domestic commerce of the Dept. of Commerce, and before that was in charge of purchasing for the War Dept., has been named director of purchases for Ford Motor Co., Dearborn, Mich.

• **Fred J. Maple** has been named manager of exhibits, John A. Roebling's Sons Co., Trenton, N. J. **Albert Neroni** succeeds Mr. Maple as manager of advertising. Mr. Neroni has formerly been assistant manager of advertising for Anaconda Wire & Cable Co., Inc.

• **J. T. Myers** has been appointed assistant general manager of the Davey Compressor Co., Kent, Ohio. Mr. Myers has just been released from the Navy. He first joined the Davey Compressor Co. in 1941.

• **Raymond L. Seitz** has been appointed to the West Coast sales engineering staff of Foote Bros. Gear & Machine Corp., Chicago. He will be located at the Pasadena, Calif. office. For many years he has been connected with the Lockheed Aircraft Corp. in the capacity of power plant engineer.

• **L. S. Barry,** in charge of Foster's New York branch, has been elected vice-president of the L. B. Foster Co., Pittsburgh. Other vice-presidents elected were: **Henry E. Fleishman,** office manager of the Chicago branch; **Glenn Morrow,** head of pipe operations; and **E. J. Shellaby,** sales manager of the Pittsburgh office.

o o o

• **George A. Kelly,** vice-president of the Pullman Co. since 1934 in charge of public relations and advertising, has been elected executive vice-president of the company, succeeding Champ Carry, who resigned to become president of Pullman-Standard Car Mfg. Co.

• **D. F. Roloff,** formerly assistant manager of sales of the old specialty transformer section, has been appointed assistant manager of the newly-created Specialty Transformer Div. of the General Electric Co., Schenectady, N. Y. **H. K. Pritchard** and **C. Stonehill** have been named manager of sales, respectively, of the general purpose components section and the lighting components section.

• **Herman W. Steinkraus** has been elected chairman of the board of directors of the Bridgeport Brass Co., Bridgeport, Conn., to succeed the late William R. Webster. **Walter R. Clark** has been named vice-president in charge of engineering; **Herbert W. Jones,** vice-president in charge of finance; **Mead W. Batchelor,** vice-president in charge of production; **Austin R. Zender,** vice-president in charge of sales; **Rowley W. Phillips,** secretary; **William R. Breetz,** treasurer; **M. K. Schnurr,** comptroller; **Everett Japp,** assistant treasurer and assistant secretary; **Warren Faust,** assistant treasurer; **John Dawson** and **A. Dean Merwin,** assistant secretary.

• **Owen H. Wenning** has been appointed sales manager of the Worcester Pressed Steel Co., Worcester, Mass. Mr. Wenning has been connected with the company as district representative in New England, and since 1942 as assistant sales manager. He has also been elected a director of the company. **Carter C. Higgins,** vice-president who was in charge of sales, assumes other duties in a new post in charge of public relations, industrial relations, and labor relations. **Charles J. Sauter,** formerly with Foote Pierson Co. and Mycalex Corp. of America, has been appointed advertising manager in addition to his sales dept. duties.

HERBERT M. RICH, JR., division manager, Electro Metallurgical Sales Corp.

• **Herbert M. Rich, Jr.,** who has been district manager of Electro Metallurgical Sales Corp. in New York for the past 3 yr, has been appointed division manager of the New York and Birmingham territories. Electro Metallurgical Sales Corp. is a unit of Union Carbide & Carbon Corp. Mr. Rich will continue to make his headquarters in New York.

• **Henry F. Schroeder** has been elected president of the Milwaukee Die Casting Co., succeeding the late Frederick J. Schroeder.

• **Robert W. Slee,** former sales manager of A. D. Cook, Inc., Lawrenceburg, Ind., has joined the Hydraulics Div. of the A. O. Smith Corp., Milwaukee, to specialize on the sale of deep well turbine pumps.

• **Walter J. Haecker,** formerly general supervisor for the Pittsburgh district, has been named manager of the Jacksonville, Fla., district of the Tire Replacement Sales Div. of the B. F. Goodrich Co., Akron, Ohio. He succeeds the late **Dewitt B. Hosman. Harry N. Roberts,** recently returned from the navy, has been appointed manager of battery and spark plug sales, succeeding **T. H. Clarke,** who has been assigned other duties. He was with the truck tire sales dept. before entering the service in 1943.

CAPT. CARL J. LAMB, vice-president, Hydropress, Inc.

• **Capt. Carl J. Lamb,** USNR, recently released from active duty, has joined Hydropress, Inc., New York, as a vice-president. He had previously been New York district manager for the Sharples Corp. and had been a turbine engineer for Westinghouse Electric Corp.

• **Davis G. Taylor** has been named sales representative of American Foundry Equipment Co., Mishawaka, Ind., for a newly created territory covering the San Francisco Bay area with headquarters in San Francisco. For the past 2 yr, Mr. Taylor was associated with sales engineering at the home office. **John Getzen** has joined H. G. Mouat, district sales representative in the Birmingham area. Prior to entering the service he was assistant to the president of the Stockhan Pipe Fittings Co. with whom he had been associated for 16 yr. **Troy T. Alverson** has been appointed sales representative in the newly created Baltimore sales office. He had been affiliated with the Crane Co., Maryland Sanitary Mfg. Co., and the Glenn L. Martin Co. **David E. Neustadt** has been made the new district representative for the Los Angeles area. He comes to American Foundry Equipment Co. from the Egry Register Co., where he held the position of Philadelphia branch manager. **John Nixon** has charge of the Foundry Co.'s sales office in Atlanta. He has recently been released from the U. S. Navy.

• **S. M. Spears, Jr.** has been promoted to assistant district manager of the New York office of Tube Turns, Inc., Louisville, Ky. He joined Tube Turns in 1936 and was assigned to the New York office in 1937. **James H. Withers** has been made district manager in charge of the firm's San Francisco and Los Angeles offices. He joined Tube Turns, Inc. in 1944.

• **I. H. Mitchell** has been appointed advertising manager and public relations director of the Eutectic Welding Alloys Corp., New York. He was formerly associated with the Crosley Corp.

• **John C. Lerach,** veteran of 34 yr service with American Steel & Wire Co. and other U. S. Steel subsidiaries, has been appointed district traffic manager at Pittsburgh for the wire company.

• **Grover L. Michael** has been elected director of Thomas Machine Mfg. Co., Pittsburgh, and **Emil Rougraff** has been appointed works manager. Mr. Rougraff, former manager of the Thomas contract dept., has been associated with the company for the past several years.

• **Paul G. Marsh** has been appointed assistant production manager of the Organic Chemicals Div. of Monsanto Chemical Co. **A. J. Pastene** succeeds him as manager of the company's John F. Queeny plant, St. Louis.

• **Stuart O. Fiedler,** research associate, has been appointed manager of the S. Chicago branch of the Bjorksten Laboratories.

• **Charles R. Hook, James B. Doan, J. Frank Drake,** and **Ralph L. Gray** have been re-elected directors of the American Rolling Mill Co., Middletown, Ohio.

• **C. M. Sloat,** former project engineer for Curtiss-Wright, has been appointed chief engineer of Lion Fastener, Inc., Honeoye Falls, N. Y.

• **Earl C. Petrie** has been appointed assistant director of research, North American Refractories Co., Cleveland, and **Henry B. Knierim** has been appointed head of the company's Cleveland engineering dept., succeeding **Charles F. Sweney,** who retired Apr. 1.

ROBERT C. PALMER, assistant vice-president in charge of operations, Ingalls Iron Works Co.

• **Robert C. Palmer** has been elected assistant vice-president in charge of operations at the Ingalls Iron Works Co., headquarters in Birmingham. Mr. Palmer will be in charge of operations at the company's fabrication plant in Birmingham, the Verona, Pa. plant and the Birmingham Tank Div. of the company. He is also the works manager of the Ingalls Shipbuilding Corp. yards at Decatur, Ala. Mr. Palmer has been connected with the Ingalls company as assistant to the vice-president and production manager.

• **Raymond K. Watkins** has been appointed the Yale & Towne Mfg. Co.'s hardware representative in West Virginia, southern Pennsylvania and the border communities in Maryland, Virginia and Kentucky. He will make his headquarters in the Pittsburgh area.

• **Fred W. Bogardus,** former advertising manager and public relations director of Marine Midland Group, Inc., has joined the staff of Bell Aircraft Corp., Buffalo, as assistant public relations director.

• **Hayden McAfee,** formerly employed on special war work for the General Electric Co., Bridgeport, Conn., has been made district representative for construction materials sales with headquarters in Boston.

• **Thornton A. Rand** has been named secretary and treasurer of Acme Steel Co., Chicago. **Miss Florence A. Aitken** becomes assistant secretary and **Theodore W. Bonnevier,** controller.

• **William E. Paris** has been elected vice-president in charge of operations of Willys-Overland Motors, Inc., Toledo.

• **Russel P. Wood,** assistant manager of the Ford Motor Co. branch at St. Paul, Minn., has been promoted to manager, succeeding **M. N. Johnson,** resigned. **Fremont W. Mitchell,** sales manager, has been made assistant manager of the branch.

• **Franklin L. Snyder** has been appointed engineering manager of the Sharon, Pa. Transformer Div. of the Westinghouse Electric Corp. and **A. C. Farmer** has become assistant to the manager of the division. **W. D. Ligon** has been appointed works manager of the new Buffalo plant into which the Motor Div. is moving from East Pittsburgh. **L. E. Lynde** has been made manager of the New England district of Westinghouse with headquarters at Boston, and **F. L. Nason,** who has been New England district manager, becomes a special representative of the company in that district. **Sidney C. Palmer** has been appointed Transportation and Marine Div. manager, and **F. S. Bacon,** Central Station Div. manager for the district.

• **Harvey H. Miller** has been elected president of the American Laundry Machinery Co., Cincinnati, and **Ethan B. Stanley,** former president, has been elected to the newly created office of chairman of the board of directors. Mr. Miller had been vice-president of the company since 1928 and Mr. Stanley had been president since 1925.

• **Paul J. Best** has been named quality manager of the Crosley Corp. Mfg. Div., Cincinnati, after having served recently as assistant to the director of quality. **T. J. Michel,** formerly engineer in charge of test equipment, has been appointed production superintendent for Crosley Cincinnati plants, Mfg. Div.

COL. ARTHUR J. SEILER, executive vice-president, Phosphor Bronze Smelting Co.

• **Col. Arthur J. Seiler** has been appointed executive vice-president of the Phosphor Bronze Smelting Co., Philadelphia. He has held the position of assistant to general works manager for the York Corp., was vice-president of Thos. Shipley, Inc., and president of York-Shipley, Inc. While in the service, he was officer-in-charge of the Baldwin Locomotive Works and General Steel Castings Corp.

• **Lynn A. Saylor** has been appointed advertising manager, Ingersoll Steel Div., Borg-Warner Corp., Chicago, succeeding **T. L. Kennedy,** who has withdrawn to establish a new wood products manufacturing business.

• **Dr. Eugene P. Wigner,** a member of the Princeton University faculty, has been appointed director of research and development for Monsanto Chemical Co.'s Clinton laboratories as Oak Ridge, Tenn.

• **C. Lawton Rucker** has been appointed resident manager of the Bauxite plant, Bauxite, Ark., of Norton Co. He replaces **J. Felton Gibbons** who has retired after 33 yr service at the Bauxite plant, first as mine superintendent and later as resident manager. He will, however, continue to act in an advisory capacity.

• **F. H. Bigelow** has been named manager of the Ilg Electric Ventilating Co.'s office in Atlanta. Replacing Mr. Bigelow as manager of the Memphis, Tenn. office is **H. H. Wilson,** recently released from the Navy. The Knoxville, Tenn. Ilg office has been reopened under the supervision of **E. Lloyd Widner,** manufacturers representative for the last 12 yr. In Louisville, Ky., **Henry M. Lutes** has been established as manager of the branch office. He had been associated with the Columbus Heating & Ventilating Co. and subsequently represented the Minneapolis-Honeywell Regulator Co., the Gates Rubber Co., and the American Air Filter Co.

OBITUARY...

• **Andrew Miedwig,** industrial engineer of United Engineers & Constructors Inc., Philadelphia, died recently. He had been associated with United for 24 yr.

• **Orrin T. Allen,** 64, former assistant manager of American Steel & Wire Co., construction materials dept. at Chicago, died Apr. 15. He served as assistant manager of construction material sales from 1918 until his retirement in 1944, and was active in concrete reinforcing sales.

• **Charles R. Ferguson,** 66, chairman of the board of directors, Pittsburgh Screw & Bolt Corp., Pittsburgh, died Apr. 13.

• **Frank S. Lampard,** 47, an engineer of Mathews Conveyor Co., Ellwood City, Pa., died of a heart attack on Apr. 16.

• **Albert J. Ott,** founder and president of the Ott Machinery Sales, Inc., Detroit, died Apr. 17.

• **William C. Dickerman,** who retired in January as chairman of the board of American Locomotive Co., New York, died Apr. 25. He had also been executive vice-president of American Car & Foundry Co.

"A NORTHERN HI-LIFT HOIST up there Would Slash Handling Costs"

An efficient Northern Hi-Lift . . . low-headroom Electric hoist serves in many ways:

1. labor saving

When men lift and move material by hand, the power generated costs you at least $5 per kilowatt hour. Power for a Hi-Lift Electric Hoist costs you less than a nickel per kilowatt hour. Manpower lifting is slow, time wasting, costly. Hi-Lift Hoists do it quickly, economically.

2. time and overhead saving

Inefficient, slow material handling causes delay and countless minutes of lost time all through the shop while other operations wait on handling. Hi-Lift Hoist saves this time and money.

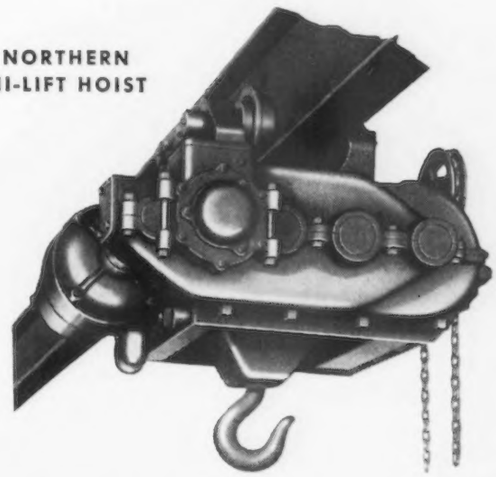
3. saving through safety

Men handling heavy material by hand are subject to serious and costly injuries. Power handling avoids these.

4. saving in floor space and overhead

Northern Hi-Lift Hoists use *no* floor space—carry the material above the floor. There is no vehicle wear on the floor—no danger to workers from rapidly moving vehicles. Aisles are used for work and walk space only—a substantial saving in space. The low-head-room feature of Hi-Lift Hoists makes better use of overhead space—permits handling of bulkier loads.

NORTHERN HI-LIFT HOIST



Northern Hi-Lift Electric Hoists are extremely sturdy, long lasting. Write for Bulletin H-3.

1542

NORTHERN ENGINEERING WORKS

TYPES OF NORTHERN HI-LIFT HOISTS AVAILABLE

Floor controlled hoists • *Motor traveled hoists*
Cab controlled hoists • *Base mounted hoists*

Dear Editor:

WAREHOUSE STEEL

Sir:

I am somewhat confused by a letter from a large warehouse source. We had inquired for 26, 24 and 20-gage hot rolled black sheets. They advised they could not place an order for these. We wrote for further enlightenment and they advised us that it is now nine months since they have been able to place any orders with the mills for 18-gage and lighter black hot rolled sheets.

. . . Is this situation general? It can mean only one thing to us—that when we are out of sheets we will have to shut down. We had just planned to install a resistance seam welder which constitutes a major investment for so small a firm. This would necessitate the use of lightly oiled pickled sheets. As nearly as I can learn, we may not be able to buy these for a year. I would appreciate any information you can give me on this general subject and any sources that might help us.

F. K. TARRANT,
President

Tarrant Mfg. Co.,
Saratoga Springs, N. Y.

● The particular gages of black sheets you require are in the heaviest demand of their history right now. Many steel companies are not taking any orders for the rest of this year and apparently warehouses are having no more luck than steel company customers in placing orders. Aside from the heavy demand for these items, a percentage of the steel rolled on the same mills that produce the items you are interested in must be set aside for tinplate, which is also in heavy demand. In fact the tinplate situation is so tight that some directives restricting the use of this product have been issued. You might try some of these smaller companies although it is doubtful that they would be any better situated than the large mills: Apollo Steel Co., Niles Rolling Mill Co., Empire Steel Corp., Follansbee Steel Corp., Granite City Steel Co., Reeves Steel & Mfg. Co.—Ed.

FOUNDRY TRADE JOURNAL

Sir:

We are interested in obtaining a copy of the Sept. 20, 1945 issue of *Foundry Trade Journal.* Can it be purchased in the states or should we enter our order directly to England?

A. H. LEWIS,
Metallurgist

Crucible Steel Co. of America,
Syracuse, N. Y.

● Photostat copies can be obtained from the Engineering Societies Library, 33 W. 39th St., New York. Back copies are available by writing the Foundry Trade Journal, 49 Wellington St., London W. C. 2—Ed.

BATTLEFIELD SCRAP

Sir:

In the report of the Metal Congress in your Feb. 14 issue, there is mention of an exhibit covering a technique for reclaiming nonferrous battlefield scrap. Could you advise us of the firm sponsoring this exhibit?

G. A. ALLEN,
Development & Engineering Dept.

Canadian Liquid Air Co., Ltd.,
Montreal

● Mr. Russell A. Hastings of Continental Industrial Engineers, Inc., Chicago, can supply you with details of the process.—Ed.

INDUSTRIAL DIAMONDS

Sir:

The Mar. 28 issue brings to light the formation of the Industrial Diamond Assn. of America. Will you kindly advise us to whom we should write in connection with membership in the association. . . .

E. J. SCHNEIDER

Engis Equipment Co.,
Chicago

● Secretary of the association is Athos D. Leveridge, whose address is 501 Lexington Ave., New York.—Ed.

SPOTWELDED FITTINGS

Sir:

In the Mar. 14 issue, p. 88, there was an item advising that the Chrysler Corp. has been successful in attaching fittings to gasoline tanks by spotwelding and using a plastic gasket where a seal is needed. We would appreciate more information on this procedure and perhaps you can give us the name of the purveyor of the gasket as well as the name of the party at Chrysler whom we can contact.

K. E. GROTH,
Purchasing Agent

Stolper Steel Products Corp.,
Milwaukee

● Chrysler policy prohibits identification of specific purveyors; however, we are certain you can obtain further information by writing Carl Heussner, Engineering Dept., Chrysler Corp., Detroit 31.—Ed.

POWDER METALLURGY

Sir:

We would appreciate receiving a tear sheet of the article "Powder Metallurgy Precision Parts" by R. Hradecky and R. Seelig, which appeared in the Sept. 27 issue.

A. FELDMAN

J. Yates Dental Mfg. Co.,
Chicago 10

ORE SOURCES

Sir:

Would it be possible for you to give us names of several iron ore mining companies who could supply substantial tonnages of ore to lake frontage on the Great Lakes?

R. W. ALEXANDER,
President

Hackensack Cable Corp.,
Hackensack, N. J.

● Suggest you communicate with the following: Oglebay, Norton Co.; Pickands Mather Co.; and M. A. Hanna Co., all of Cleveland.—Ed.

WELDING ELECTRODES

Sir:

Please forward two copies of tables I and II covering various types of electrodes as published in connection with the article on "Welding" in the Jan. 3 issue.

D. E. MERRIMAN,
Purchasing Agent

Stanley Works,
New Britain, Conn.

● We have reprints of the "Chart of Comparable Arc Welding Electrodes" available at 20¢ a copy. Copies are being forwarded to you.—Ed.

SINGLE-POINT TURNING

Sir:

It would be appreciated if you could forward a copy of the article "Single-Point Turning Research" by Joseph F. Allen, appearing in the Jan. 17 issue on pp. 69 through 72.

H. F. EISENGREIN,
Plant Engineer

Steel & Tubes Div.,
Republic Steel Corp.,
Brooklyn

MAXIMUM PRESSURES

Sir:

Do you have or could you tell us where we can secure ASME figures showing the maximum pressures per sq in. that tanks of varying diameters and lengths will stand. We have in mind those with standard flanged and dished heads as well as regular flat flanged heads. The materials would run from 10 gage to ½ in. steel plate which is the regular tank quality steel.

G. A. BREENE

Breene-Sloan Mfg. Co.,
Emlenton, Pa.

● This information can be obtained from the ASME Code for Unfired Pressure Vessels, which sells for $1.50 a copy, available from the American Society of Mechanical Engineers, 29 W. 39th St., New York.—Ed.

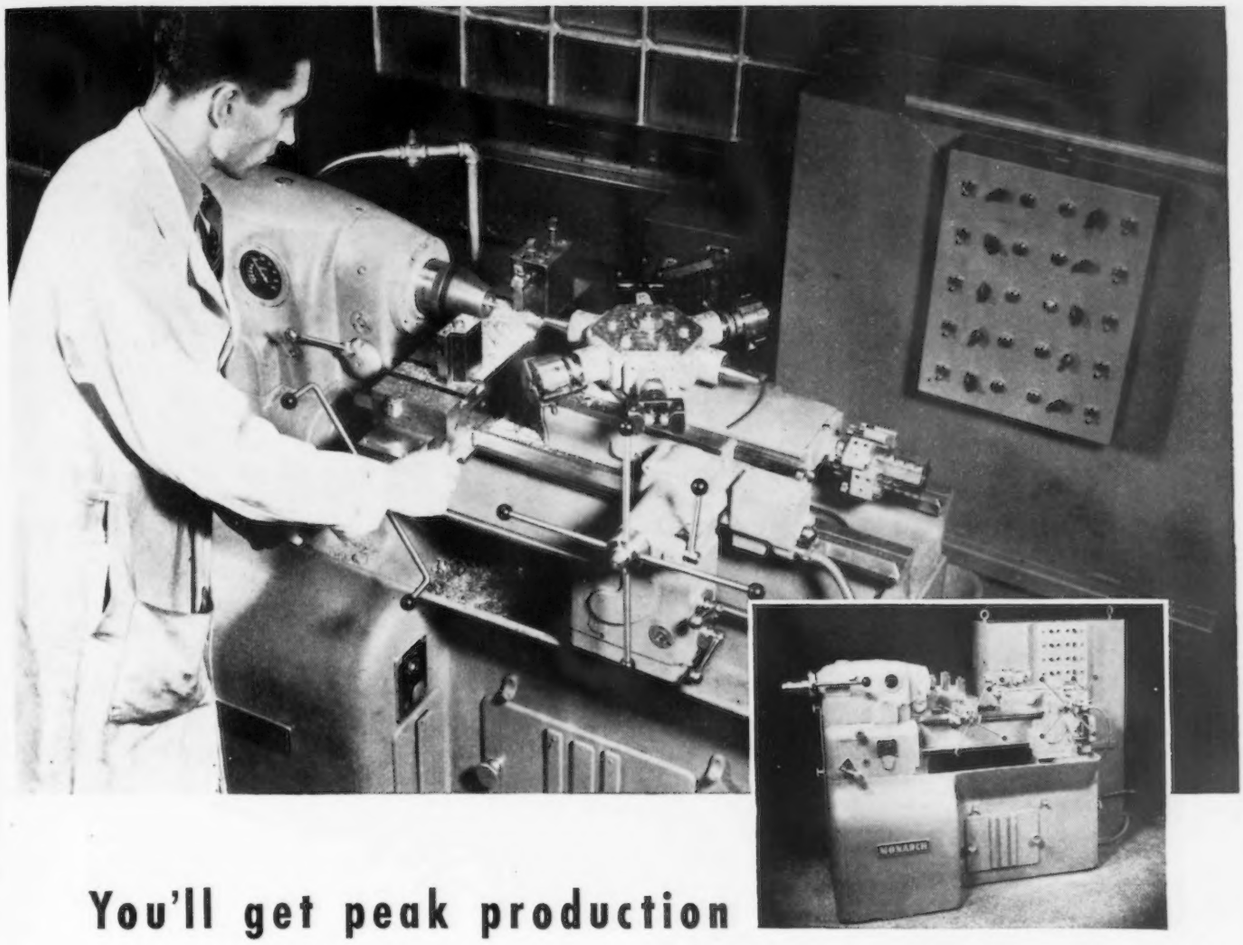
IRON AND STEEL PRICES

Sir:

Would you please be good enough to forward four tear sheets of the page of Iron and Steel Prices as shown in the Mar. 7 issue.

J. TRIGGS

Hugh Russel & Sons, Ltd.,
Toronto, Canada



You'll get peak production AT A PROFIT—with the *Speed-Matic**

Automatic electronic speed change, preselected for as many as ten stations. Complete range of spindle speeds—50 to 5000 RPM. Feeds from .0005" to .016" per revolution. Collet chuck capacity 7/8".

You can define the Speed-Matic's specifications with those facts—but you can't describe its production capacity till you've seen it *in operation.* Finished parts roll off like peas shucked from a pod—and with unsurpassed accuracy. We think you'll call it *The World's Fastest Hand Screw Machine.*

With the Speed-Matic you'll get toolroom accuracy at production line speed. The skill you used to need in an operator has been built into the machine—to combine maximum high production with extreme accuracy, on lots of 25 to 500 or higher. Power feed ram type turret is teamed with a spring-return hand-operated cut-off slide.

* **SPEED-MATIC** — Add this new name to your metal-turning dictionary — you'll be hearing a lot of it — wherever rising production costs are a factor. The *Speed-Matic* is Monarch's answer to this problem in the hand screw machine field. For chucking and fixture work it's the *Uni-Matic:* for between-centers work it's the *Mona-Matic.*

Get full details on these three new machines *now* — from your nearest Monarch representative — or write us direct.

The Monarch Machine Tool Co. • Sidney, Ohio

ACCURACY · ECONOMY · LONG LIFE

Monarch TURNING MACHINES

This Industrial Week . . .

- ***Steel Rate Down 5.5 Points to 68.5 Pct***
- ***Strike May Soon Paralyze the Industry***
- ***New Price Increase to Be Made Shortly***

STEEL ingot output this week dropped 5½ points to 68.5 pct of rated capacity but it will take a much sharper dive next week as additional steel firms find their coal piles dwindling. The total loss of steel ingots up to the end of this week because of the strike is more than 1,000,000 tons. By the end of next week the total loss will come close to 1,750,000 tons unless the coal strike is ended, which is less than a remote possibility.

Serious from a manufacturing standpoint is the effect of the coal strike this week on steel users through curtailment of the use of industrial power. Varying utility company coal stocks provide no uniform national basis for curtailment of service, but in some important industrial centers regulations are beginning to appear which will cut power consumption for manufacturing as much as 50 pct. Plans in some areas even call for restricting industrial power consumption to the hours between 8 a.m. to 12 noon.

A third effect of the coal strike, should it continue for a few more weeks, would be to cut down some shipments to railroad lines where the supply of coal has become dangerously low. Many railroads had much less than the normal supply of fuel when the mine walkout occurred. It may be necessary soon for the government to requisition fuel for railroads which face drastic curtailment of freight hauls.

The steel industry this week was on the verge of starting successively sharp reductions in activity. If the coal controversy is not settled by June 1. the overall effect will approach the chaotic production and order situation which resulted from the steel strike earlier this year. Production schedules have already been disrupted to some extent and many companies have found their delivery promises further and further extended.

SOME increase has been noted in the volume of new steel orders this past week as customers begin filing requests for 1947 tonnage. Few mills will give definite delivery commitments on these orders until the production prospects of 1946 quotas become clear. Orders for 1947 consumption are being held for future scheduling in such amounts as can be justified.

In an effort to supply steel companies with a better return for those products on which the profit is small or nonexistent, the OPA will soon take action to revise the prices of certain steel products upward. This action, it is hoped, will also serve the purpose of stepping up production of these low-return products. Many mills were forced to drop some of these steel products from their schedules in order to concentrate on the output of more lucrative items and thus compensate for the sharp increase in steel wages.

Steel officials, CPA and OPA are meeting this week to allocate increases to the various low-return steel products. It is expected that part of the increase will involve alloy steels which will receive an advance of 8.2 pct instead of the 4 pct recently granted by the OPA. The OPA does not believe that the increases to be made soon will be any more inflationary than was the general steel price increase made on Mar. 1 because of certain deficiencies in the total amount of the increases allocated to steel products at that time.

While the steel industry was granted permission to raise tinplate $5 a ton as of Feb. 15, the action was nullified because all large tinplate producers had already signed 1946 contracts at the old price. It is expected that the OPA will move quickly on this latest steel price adjustment in order to alleviate the unbalanced situation in the production of certain steel products. The latter are urgently needed by steel users to round out their manufacturing programs.

REPORTS of isolated black market transactions in steel are becoming more frequent. On the fringes of the industry, various reports are drifting in of ingenious efforts by steel consumers to avoid the steel supply squeeze. One method involves the resale of materials secured on quotas by firms which do not require the steel. Such transactions are definitely few and far between, but barter of individual steel items in order to overcome unbalanced inventories may become more prevalent.

Some customers located in remote territories from sources of supply are taking delivery near the point of production in some instances so as to continue to secure steel from producers who otherwise would withdraw because of high freight absorption.

According to reports, some producers have been approached by persons offering commissions of $5 to $10 a ton for flat-rolled products and small rounds. These isolated cases of black market tendencies are by no means descriptive of anything but a very small part of the steel market situation, but they are straws in the wind reflecting the extremely tight steel supply.

With pig iron supplies becoming shorter and shorter due to curtailment of blast furnaces because of lack of fuel, the accent on scrap has increased enormously. Steel firms which have been cut off from the use of hot metal in steelmaking are charging extra heavy amounts of scrap in openhearth furnaces. This practice is reducing scrap inventories rapidly and when the coal strike is settled scrap supplies may approach the crisis stage in some areas.

• **CANADIAN STEEL OUTPUT SHORT**—Production of iron and steel in Canada falls far short of meeting domestic demands, and conditions as they now exist are having serious effect on Canadian external trade in iron and steel and their products. Difficulty in obtaining steel also is responsible for restricted activities of manufacturers in their peacetime production program. he statement by H. G. Hilton, president of the Steel Co. of Canada, which deals largely with his own company, also presents the picture for the Canadian steel industry as a whole. Mr. Hilton stated that current steel production in Canada is nearly double the annual maximum rate of prewar years, but nevertheless there are shortages of steel of every kind. Various exports of agricultural implements, freight cars, locomotives, ships and other steel manufactures for the rehabilitation of devastated countries and the domestic demand released by the gradual removal of war time restrictions, have resulted in a combined tonnage far in excess of anything the Canadian iron and steel industry has ever been called upon to cope with.

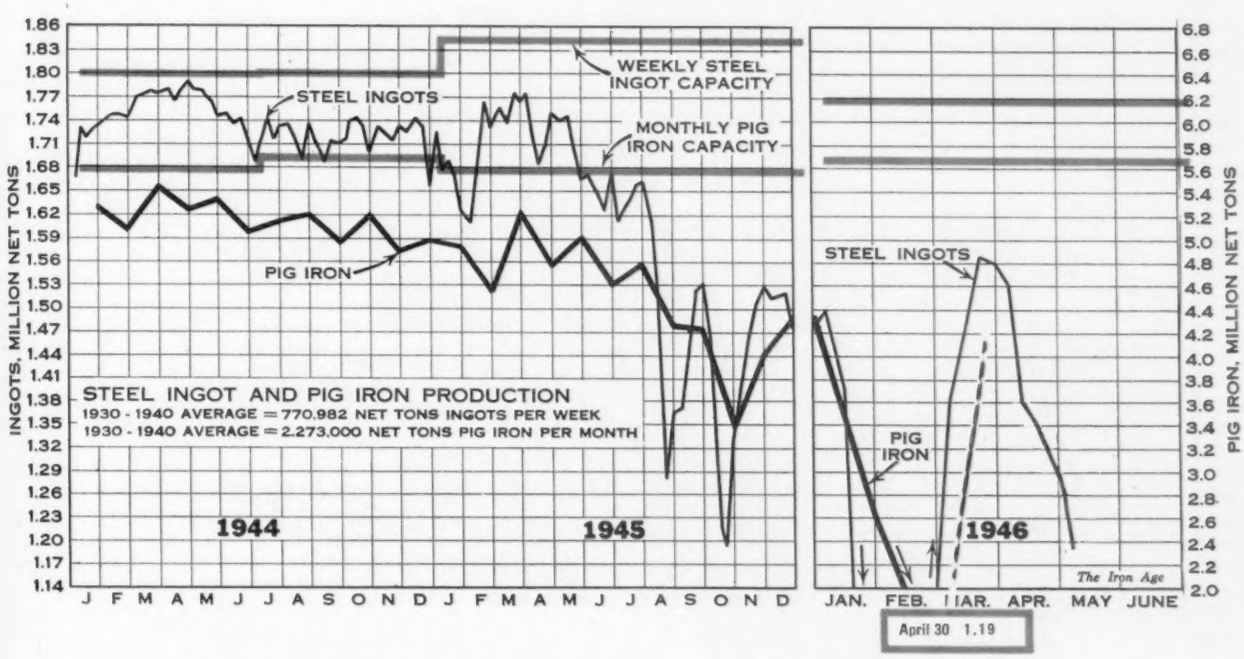
• **IRON ORE CONSUMPTION**—Consumption of Lake Superior district iron ore increased in March to 6,021,018 gross tons from 1,748,469 tons in February, bringing the three-month 1946 total to 11,488,445 tons compared with 20,435,199 in the corresponding period of 1945, according to the current report of the Lake Superior Iron Ore Assn. Reflecting the steel industry's return to high operating rates, the association's report showed 160 blast furnaces which depend principally on Lake Superior District iron ore, 154 in the United States, and six in Canada, in blast Apr. 1, compared with 145 on Mar. 1. Iron ore stocks at furnaces and on Lake Erie docks totaled 27,601,106 tons on Apr. 1, compared with 33,647,260 a month ago, and 17,303,-561 on April 1, 1945.

• **STEEL SHORTAGE CLOSES PLANT**—Pullman-Standard Car Mfg. Co.'s Michigan City freight car plant stopped production last week because of lack of steel. The plant which normally turns out 54 freight cars a day, cut production 50 pct Apr. 1 because of the steel shortage. The shutdown is scheduled to last two weeks, but unless more steel is available at the end of that time, will remain closed until sufficient inventories are acquired. No reductions have been placed in effect at the company's other plants, but will be necessary if steel shipments are cut off by the coal strike, it was stated.

• **PLUMBING FIXTURE CHANGES**—The veterans housing program has caused a major revision in the sales program of Crane Co., manufacturers of plumbing supplies and fixtures. "This will call for a much larger percentage than expected of the more standard and competitive products we make and channeling them into low cost housing developments," John H. Collier, president, told the Crane stockholders at a meeting recently.

• **URGES DISPOSAL SPEEDUP**—Lt. Gen. Edmund B. Gregory, War Assets Administrator, has instructed each of the 33 regional directors of WAA to speed up the disposal of all types of farm machinery and equipment to help overcome the critical farm production crisis. This is in line with a promise which General Gregory recently made to leaders of national farm organizations that WAA will get all farm machinery and equipment into the hands of the farmers as quickly and as directly as possible.

• **COAL COOPERATION**—Many steel companies that had a fair supply of coal before the coal strike started have helped those companies which found their supply getting shorter and shorter. This good-heartedness, however, will have to come to an end this week as most steel firms are now in the position where their rate will take a sharp dip this week-end and next week. This same cooperation between companies prevailed in the last coal tieup.


INGOTS, MILLION NET TONS
PIG IRON, MILLION NET TONS
WEEKLY STEEL INGOT CAPACITY
STEEL INGOTS
MONTHLY PIG IRON CAPACITY
PIG IRON
STEEL INGOT AND PIG IRON PRODUCTION
1930 - 1940 AVERAGE = 770,982 NET TONS INGOTS PER WEEK
1930 - 1940 AVERAGE = 2,273,000 NET TONS PIG IRON PER MONTH
1944
1945
1946
J F M A M J J A S O N D J F M A M J J A S O N D
JAN. FEB. MAR. APR. MAY JUNE
The Iron Age
April 30 1.19

Steel Ingot Production by Districts and Per Cent of Capacity

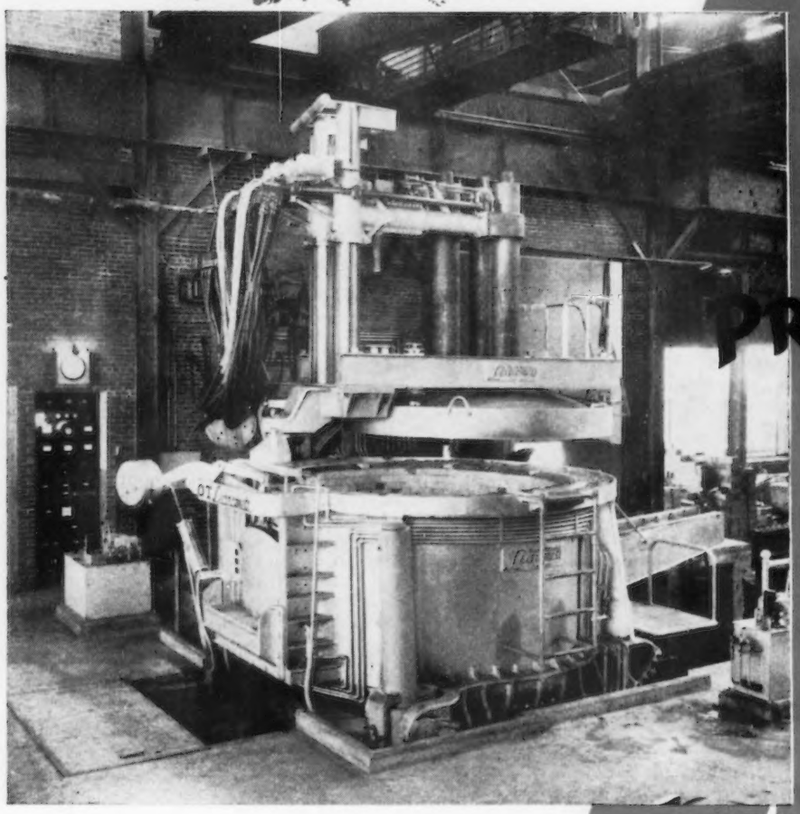
Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
April 23	63.5*	72.0	69.5*	84.0	91.5*	104.0*	81.5	63.0	98.0	55.0	86.0	72.0	96.5	74.0
April 30	60.0	68.0	61.5	75.0	88.0	98.0	77.0	63.0	98.0	54.0	69.0	65.0	88.0	68.5

* Revised

MOORE RAPID

Lectromelt TOP CHARGING

FURNACES



LOWERS PRODUCTION COSTS

Size OT Lectromelt for melting 12 ton heats. Roof has been raised and swung aside, ready for charging.

MORE production per man hour is an effective means of lowering production costs and that is exactly what Lectromelt's experience *proven* top charging design can do for you.

The top-charge furnace readily cuts down that interval between heats. The furnace roof is hydraulically raised and swung aside by the operator moving one valve . . . the drop-bottom bucket places a full charge . . . hydraulic power returns roof to operating position and the furnace is ready to begin melting again. One user reports a three to five minute power off to power on interval averaged, with 30% more pounds produced per man hour with the top-charge furnace than with a door-charge type.

Lectromelt Top-Charge Furnaces are available in capacities ranging from 100 tons down to 250 pounds.

PITTSBURGH LECTROMELT FURNACE CORPORATION

PITTSBURGH..30..PENNA.

OPA to Take New Price Action on Low Return Steel Items

Philadelphia

By JOHN ANTHONY

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• • • **Already acting** along the lines prescribed by the current wave of economic prophets, the Metals Branch of OPA is about to authorize the distribution to the steel industry of many millions of dollars in increased prices in order to encourage additional production of low profit product lines, according to responsible sources.

The final details of the allocation of price increases to products were to have been worked out by CPA in consultation with its steel industry advisory committees, Wednesday, May 1, and by OPA with its steel industry advisory committees on the following day.

OPA is reported to consider that these price increases to be granted to the steel industry will not exert any additional inflationary pressure on the economic structure than represented by the increases already granted because the $5 per ton increase on tin mill products cannot be realized by that industry due to the completion of long term contracts at the old price. Whether products to be raised will be returned to their former price ceilings by OPA action has not yet been determined by officials, according to the report.

Top steel industry executives have already been informed of these plans for government price action and the members of at least one branch of the steel industry have been informed fully and frankly by OPA officials of their plans.

It is understood that at the time the $5 price increase for tin mill products was under consideration by price and production executives of government, there was a difference of opinion between the agencies as to the desirability of the increase at that time. However, it was not disclosed to the meeting by the informed members of the industry advisory committee that the long term contracts for tin mill products at the old price had already been concluded.

The action to be taken by OPA follows closely the tight situation with respect to many steel items which are either in small production or have been eliminated from steel mill schedules. In the case of low return items there have been cutbacks on schedules in order to produce more of those steel products having enough profit to help offset the steel wage increase recently granted.

Complaints have come from small consumers that they were unable to obtain enough steel to keep operations going in their plants. CPA, along with steel industry advisers, have insisted that steps have been taken to remedy this situation, although it has been pointed out that the shortage of steel is affecting all customers, large and small.

Whether or not the quick action which OPA is expected to take to open up the flow of the low return items will replace or have any effect on demands to be made by the industry at the end of the 90-day period remains to be seen. Nevertheless, the attitude of OPA on needed price revisions for those items which cannot be produced at tonnage levels sufficient to take care of the demand is said to be well received in the steel industry.

British Plan Would Scrap 5 Million Tons of Steel Capacity

London

• • • **The British Iron & Steel** Federation modernization plan to be published as a white paper in the near future is expected to call for the scrapping of five million tons of existing steel ingot capacity and the construction of approximately six million tons of new capacity. This would leave the United Kingdom with about 16 million tons capacity, one million of which could be held in reserve.

No promises are expected in the report on the future trend of British steel prices, although the industry is at least paying lip service to calls for substantial reductions. The familiar trends of costs for coal and the threat of high ore prices may mean that reductions are impossible.

Some authorities state that substantial reductions in coal consumption per ton of steel output effected during the war render rising coal costs unimportant.

Including announcements already made it seems likely that the plan contemplates increases in hot rolled strip production amounting to about a million tons per year. Most of this is slated for the South Wales district.

South Wales seems destined to get the largest portion of the $672 millions to be invested under the plan, with the Northeast Coast production district due to receive the next largest sum.

A completely integrated steel plant in the Midlands to utilize native ironstone in the district may be the biggest new item disclosed when the white paper appears.

OPA Permits Cost Recovery

Washington

• • • **Manufacturers of tools,** dies, jigs, fixtures, molds and patterns have been permitted by OPA to continue their base period practices and also to recover total costs. OPA, taking this action through an amendment to RMPR 136, machines, parts and industrial equipment, said that this step removes the price barrier to production of these items.

Concrete Bar Institute Meeting Reflects Difficulties of the Industry

Hot Springs, Va.

• • • **At a meeting** of the Concrete Reinforcing Steel Institute here last week Warren M. Huff, chief, Metals Branch, OPA, announced that fabricated steel and fabricated plate were about to be removed from price control except at the mill level.

Mr. Huff and W. T. Butler, chief of the Fabricated Products Section of the Metals Branch, were present to discuss with institute members the means for improving raw materials supply with bar and wire fabricators to assure adequate production of reinforcing steel products. During the course of the discussion the OPA executives freely invited the members of the industry to voice their opinions as to the causes of the apparent shortage of basic materials and to inform them of obvious inequities in the pricing of reinforcing steel products. The meeting was significantly harmonious in its tone.

Members of the industry advised the OPA officials that the principal price adjustments which were considered required were made necessary by the considerable increase in the cost of labor and materials for engineering and designing work and the labor cost for bending operations. Another adjustment sought was in the additional compensation over rail costs for delivery by truck which, according to the present wording of Price Regulation 159, results in an out-of-pocket loss to fabricators on delivery charges. The OPA men agreed at the meeting to look into the possibility of working out price adjustment that would serve to relieve these situations and to assure a larger supply of bars to the industry.

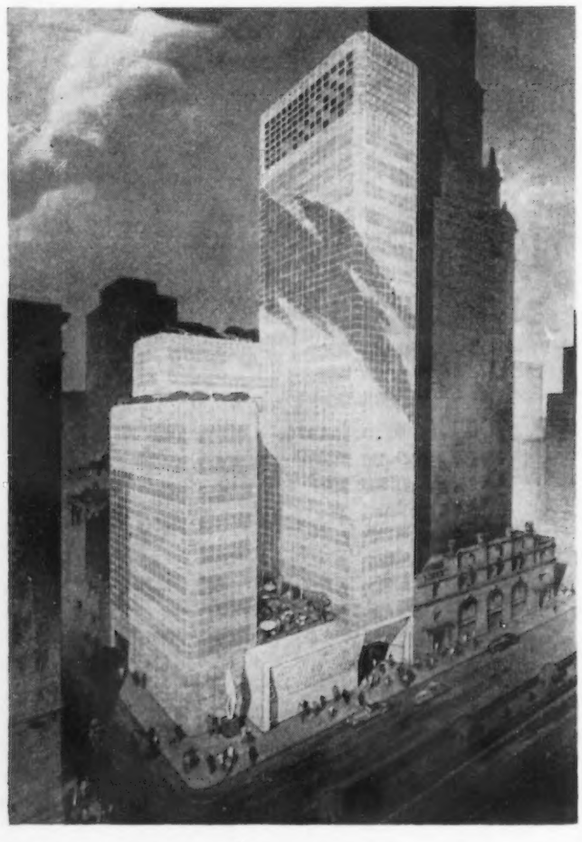
At the meeting there was some discussion of an investigation into the use of prefabricated reinforcing bar units, shop-welded in sections designed to be readily laid into concrete forms. This investigation, under the direction of A. P. Clark, is made necessary by the use of thinner concrete sections made possible by the use of higher strength concrete and greater bond strength between concrete and steel, coupled with a more accurate knowledge of the strength of reinforced concrete sections.

The institute is working on a revision of its "Handbook of Useful Data" on reinforced concrete sections, under the direction of R. C. Reese, in order to take advantage of the developments mentioned above.

One of the significant reports at the meeting was from the Committee on Reinforced Concrete Research of the American Iron and Steel Institute, rendered by R. R. Ziprodt. The research projects now underway under AISI auspices include a cooperative reinforced concrete footing investigation at the University of Illinois involving 160 footings, elimination pull-out tests on 17 patterns of deformed bars at the National Bureau of Standards, flexural-type bond tests on the five best bar patterns developed in the pull-out tests, and suggested minimum requirements for deformed concrete reinforcing bars. These minimum requirements are now under consideration by government for adoption as a federal specification.

The flexural bond tests have resulted in the selection of the following bars for further testing: the Jones & Laughlin Improved Diamond Bar, the Laclede Steel Co. 45° Improved Rail Steel Bar, the Carnegie-Illinois Rib Bar, and a plain round bar of 7/8 in. diam for comparison. The Inland Steel Hi-Bond Bar and the Bethlehem Steel "C" and "D" bars (improved wave type deformations) were later added to the series.

It was revealed that two additional projects have been approved for investigation by the AISI committee as soon as practicable; tests of slabs (and beams later) to determine permissible stresses in design, and the design of structural members subjected to torsional stresses. The former test is to study ratios of slab span to thickness, percentages of steel reinforcement and sizes of reinforcing bars and will be based on determinations of the manner and degree in which stresses accumulate in reinforcing steel and concrete. The latter investigation will study the types of web reinforcement for use in beams, gir-



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ALUMINUM DOES IT AGAIN: *The drawing is an artist's conception of the 20-story building to be erected by the Aluminum Company of America at Park Ave. and 58th St. According to the company, it will be the first building to employ a new type of construction embodying an aluminum-faced curtain wall. The entire facade will be aluminum and site-clearing will start as soon as conditions permit.*

o o o

ders, slabs and flat slabs in order to resist torsional stresses.

At the meeting the following new officers were elected: S. V. Taylor, president, Concrete Steel Fireproofing Co., Detroit; H. E. Calves, vice-president, Taylor-Davis, Inc., Philadelphia; E. B. Wilkinson, vice-president, Wilson - Weesner - Wilkinson Co., Knoxville, Tenn.; J. R. Fenstermaker, treasurer, Hugh J. Baker & Co., Indianapolis; H. C. Delzell, executive secretary.

Directors include the following: H. D. Jolley, Ceco Steel Products Corp., Chicago; Blair M. Boisseau, Virginia Steel Co., Inc., Richmond; H. E. Calves, Taylor-Davis, Inc., Philadelphia; D. J. Cameron, Fireproof Products Co., New York; James F. Curley, Concrete Steel Co., New York; J. R. Fenstermaker, Hugh J. Baker & Co., Indianapolis; Charles M. Gunn, Gunn, Carle & Co., San Francisco; O. W. Irwin, Carnegie-Illinois Steel Corp., Pittsburgh; James D. Maitland, Colorado Builders' Supply Co., Denver; H. E. Perry, Mosher Steel Co., Houston; W. H. Stewart, Truscon Steel Co., Youngstown; F. F. Trierweiler, Joseph T. Ryerson & Son, Inc., Chicago; A. B. Egan, Sheffield Steel Co., Kansas City; E. B. Wilkinson, Wilson-Weesner-Wilkinson Co., Knoxville, Tenn.

•

Washington

• • • **Effective May 1,** OPA on Apr. 30 suspended fabricated steel shapes and plates from price control. These products formerly were covered by the general maximum price regulation. Fabricated products and services covered by all other price regulations—Maximum Price Regulations 136, 159, 251, 581, or 591—remain under control and are not affected by the action suspending control over fabricated structural shapes and plates. This latter move was made through Amendment 16 to supplementary Order 129—exemption and suspension from price control of machines, parts, industrial equipment and services.

OPA said, "that suspension of control over these two steel products was taken after it was determined that the administrative burden of continued price control for them would outweigh its benefits to the stabilization program." The suspension, it was declared, will permit the price agency to maintain more effective control on goods more vital to the program.

OPA also pointed out that although the cost of fabricated plates and shapes make up a substantial part of the initial cost of highway structures, industrial and commercial buildings and similar projects, the cost, when amortized, becomes relatively insignificant as a business expense. In residential construction, the cost of the products being suspended from control is relatively small and any increase will have little or no effect on the cost of living.

"Because fabricators of these products have incurred substantial increases in material and labor costs, some price increases over present levels are expected," OPA said. However, it is not likely that excessive increases will result because fabricating capacity exceeds present and anticipated demand and many of these products have been selling below their ceiling prices, it was stated.

Moreover, it was added, diversion of manpower or materials from equally or more essential production is not likely. This was said to be true of these products partially because of government limitations upon certain types of construction imposed as part of the housing program.

ICC Denies Railroads Freight Rate Increase; Sets Hearing for May 6

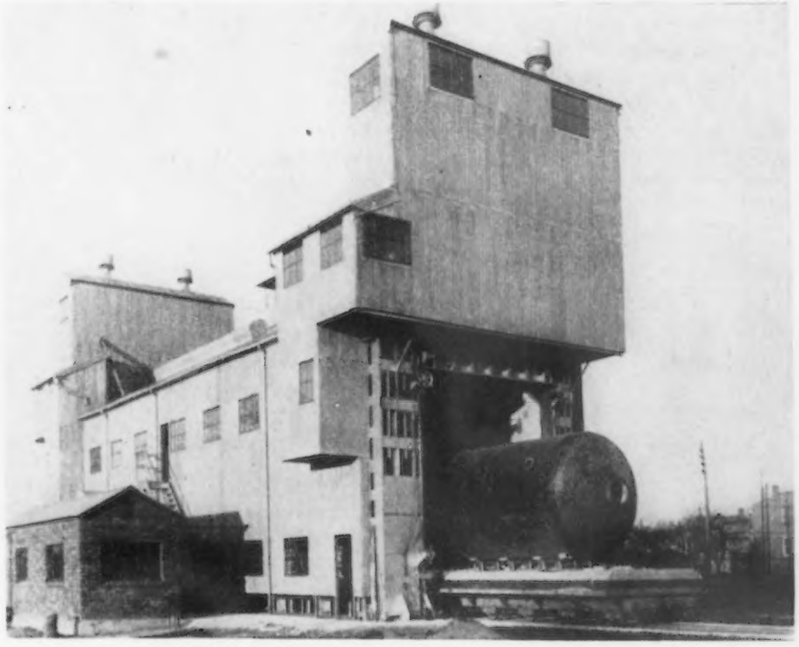
Washington

• • • **Denying the petition** of the railroads to increase freight rates by 25 pct, with some exceptions, without first holding a hearing, the Interstate Commerce Commission has set May 6 as the date for a hearing. The carriers had asked that an overall rate boost be granted, effective May 15, on one day's notice, any necessary adjustments to be made later.

Protests against the petition were filed with the Commission by OPA and a number of shipper organizations.

Prospect of an early increase in freight rates was seen as a possibility, however, since the commission, in setting a hearing date, also reopened the socalled 10 pct general freight rate increase case. In this proceeding the Commission granted increases averaging 4.7 pct. The increases were suspended in May, 1943. The Commission will consider whether these rates should again be put into effect immediately pending disposal of the petition for a general 25 pct rate increase.

TURKISH BATH FOR TANKS: *One of the first charges entering the recently completed stress relieving furnace of Chicago Bridge & Iron Co., at Chicago. This is the largest of three furnaces constructed by Rust Furnace Co., Pittsburgh, for Chicago Bridge, being* 85 *ft by* 15 *ft* 2 *in. by* 16 *ft high from car floor to spring of arch. It has a car width of* 11 *ft.*



CPA Permits Wider Use Of Tin Mill Products In Container Industry

Washington

• • • **Without making any** overall relaxations, CPA has announced changes in the permitted uses of tin mill products in containers. The changes were made in container order M-81, CPA said, to bring its provisions in line with changing industrial conditions.

Important changes in the order include:

(1) Allowing packers their choice of using 1941 or 1945 as a base period for calculating their 1946 packing quota. Prior to this amendment, quotas were predicated on the cans used during 1945 only.

(2) A number of nonfood products were listed in Schedule 1 of the order which allows packers of such products an opportunity to obtain metal cans under the preference B sequence of delivery, equal to 100 pct of those used in 1941 or 1945. The following nonfood products have been reinstated in the order as they were inadvertently omitted in the Mar. 1, 1946, amendment to the order: a—Abrasives and valve grinding compounds, b—boiler sealing compounds, c—buffing compounds, d—caulking compounds, e—gasket assembling compounds, f—graphite with liquid content, g—lubricating greases, h—soap, paste, i—solder paste, and j—welding fluxes.

(3) Food products of a seasonal and perishable nature which heretofore were restricted to a monthly use of not more than 10 pct of the annual quota, may now be packed unrestricted by monthly percentages.

(4) The base period for quotas on frozen foods except frozen cherries, has been changed from 1944 to 1945. The base period on the latter is still 1944.

(5) Packers of beans with tomato sauce (other than for U. S. Army export or U. S. Navy offshore use) have been given an option of using plate containing 1.25 lb of tin per base box for solder parts instead of 0.5 lb plate (a base box contains 31,360 sq in. of tinplate). However, if this option is exercised, a pack must be limited to 50 pct of a base year instead of 100 pct when 0.5 lb tinplate is used for the soldered parts.

(6) Containers for packing whole milk (dry or powdered) have been moved up to the A sequence of delivery from the former B category. The packing quota is now unlimited.

(7) A packer who used fiber body cans to pack paint in the base period, may consider those cans as though they were made of all metal, for the purpose of calculating his 1946 packing quota.

Political Unrest Delays Shipments from Sumatra

Washington

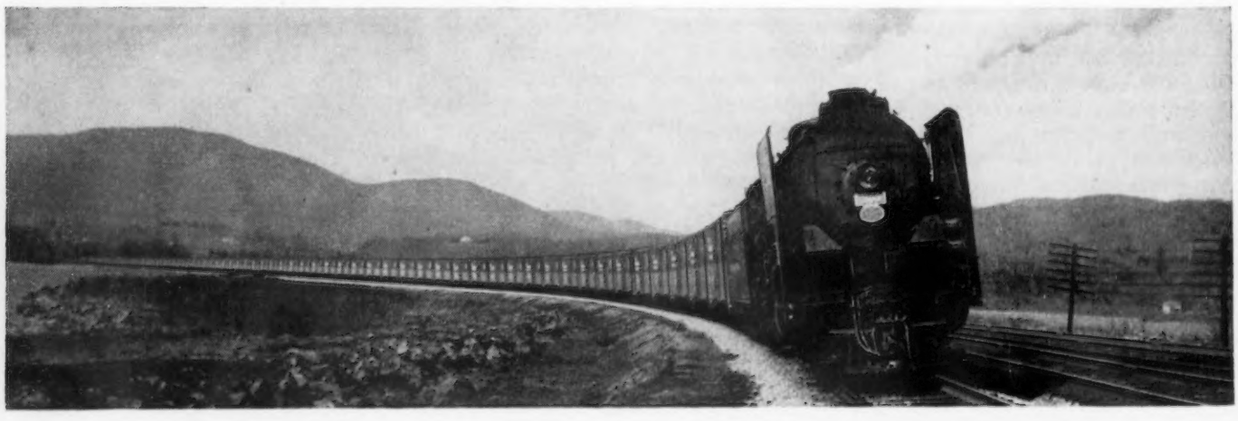
• • • **Revival of Sumatra's** production of tin, palm oil, rubber and other products is being delayed by political unrest, financial instability and lack of equipment and trained labor. In an article written for the May 4 issue of the Foreign Commerce Weekly, Dorothy V. Knible of the Far Eastern Div., Office of International Trade, says that early resumption of shipments are not likely. High grade Sumatran tin ores, it is pointed out, have been shipped only in small quantities, while palm oil, which, like tin, is used by the tinplate industry, is not yet available to the world market. Crude rubber has not yet begun to be exported in quantity from the island.

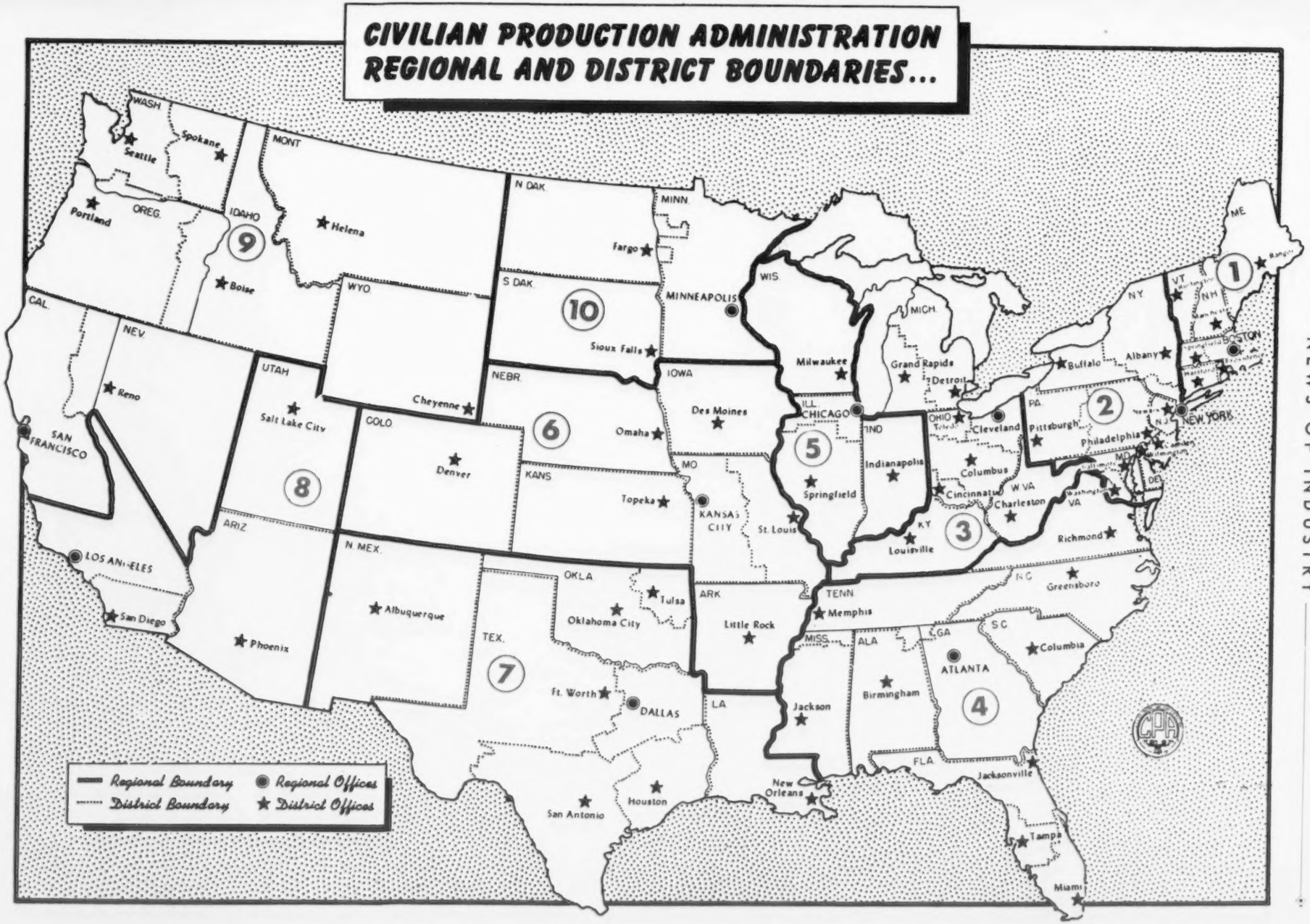
Before the war, the article says, about one-fifth of the world's supply of tin came from three small islands off the coast of Southeast Sumatra—Banka, Billiton and Sinkep—but the Dutch destroyed many of the mine installations before they retreated. Little information has come from Banka, the most important producer, where tin production was entirely government operated before the war. Operations have begun on a small scale at Sinkep, where prewar output was not large.

Billiton's deep mines are not working, it is stated. Some hoisting gear and parts of the ore dressing plant were removed as well as a large part of the electrical equipment.

About 80 pct of Sumatra's palm oil plantations are intact and quantities of palm oil are stored in Sumatra, according to some reports, the article says. Before the war Sumatra was the leading producer of palm oil for export, with a production in 1941 amounting to 250,000 tons, out of a world total of 550,000 tons.

FAST FREIGHT'S FIRST RUN: *This 80-car fast freight is the "Pacemaker" of New York Central's service which will operate overnight from New York City to Buffalo. The specially-built box cars are equipped for speeds of 65 mph and are painted vermillion and gray for quick identification in freight yards.*




CIVILIAN PRODUCTION ADMINISTRATION
REGIONAL AND DISTRICT BOUNDARIES...
WASH
Seattle
Spokane
MONT
Portland
OREG.
IDAHO
9
Helena
Boise
WYO
N DAK.
Fargo
MINN.
S DAK.
10
Sioux Falls
MINNEAPOLIS
WIS.
CAL.
NEV.
Reno
SAN FRANCISCO
UTAH
Salt Lake City
8
COLO.
Denver
Cheyenne
NEBR.
6
Omaha
IOWA
Des Moines
ILL.
CHICAGO
5
Springfield
IND.
Indianapolis
MICH.
Milwaukee
Grand Rapids
Detroit
OHIO
Cleveland
Columbus
Cincinnati
Toledo
KANS.
Topeka
MO.
KANSAS CITY
St. Louis
KY.
Louisville
3
W VA.
Charleston
VA.
Richmond
ARIZ.
LOS ANGELES
San Diego
Phoenix
N. MEX.
Albuquerque
OKLA.
Oklahoma City
Tulsa
TEX.
7
Ft. Worth
DALLAS
ARK.
Little Rock
TENN.
Memphis
MISS.
Jackson
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New Orleans
ALA.
Birmingham
GA.
ATLANTA
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SC.
Columbia
NC.
Greensboro
FLA.
Jacksonville
Tampa
Miami
San Antonio
Houston
PA.
Pittsburgh
Philadelphia
2
NY.
Buffalo
Albany
NEW YORK
NJ.
MD.
DEL.
VT.
NH.
ME.
1
BOSTON
Regional Boundary
District Boundary
Regional Offices
District Offices

CPA Limits CC Ratings For Building Machinery

Washington

• • • **Effective Apr. 22,** CPA has issued Direction 15 of PR 3, which prohibits CC ratings for construction machinery beyond the dealers and sales organizations representing producers. However, producers selling direct to consumers must continue to accept such ratings. CPA said the action was taken to prevent any disruption of producers' schedules. It was declared that construction machinery will continue in tight supply in the face of the $10 billion construction planned this year exclusive of the $3.8 billion for housing.

Under the directive no dealer, distributor or branch sales office may extend any CC rating to a construction machinery producer. Producers, on the other hand, will treat as unrated orders all orders received from distributors and sales organizations.

In some segments of the industry, producers sell directly instead of through dealers or branch sales offices. Such producers will continue to be subject to the provisions of PR 1 requiring the acceptance of such "CC" ratings from users.

Construction machinery has been defined in the new direction to include: (1) Tractor mounted equipment, (2) specialized machinery, (3) construction material mixers, pavers, spreaders and related equipment, (4) construction material processing equipment, (5) power cranes, derricks, draglines, dredges, shovels and related equipment, (6) scrapers, maintainers and graders, (7) contractors' elevating winches and hoists, (8) earth rock and water well drilling and boring machinery, and (9) tracklaying tractors.

AMERICAN IRON AND STEEL INSTITUTE
CAPACITY, PRODUCTION AND SHIPMENTS

Period: January and February, 1946

Steel Products	Number of companies	Items	Maximum Annual Potential Capacity Net Tons	Current Month: Production Net Tons	Current Month: Production Per cent of capacity	Current Month: Shipments (Net Tons) Total	Current Month: Shipments (Net Tons) To members of the industry for conversion into further finished products	To Date This Year: Production Net Tons	To Date This Year: Production Per cent of capacity	To Date This Year: Shipments (Net Tons) Total	To Date This Year: Shipments (Net Tons) To members of the industry for conversion into further finished products
Ingots, blooms, billets, tube rounds, sheet and tin bars, etc.	37	1	xxxx	xxxx	xxx			xxxx	xxx	368,433	175,866
Structural shapes (heavy)	12	2	9,421,550				xxxx	250,708	17.2	277,538	xxxx
Steel piling	5	3					xxxx	11,451		9,311	xxxx
Plates (sheared and universal)	27	4	17,030,770					362,921	13.1	371,097	30,211
Skelp	5	5	xxxx	xxxx	xxx			xxxx	xxx	32,592	9,534
Rails—Standard (over 60 lbs.)	4	6	3,657,000				xxxx	127,491	21.6	133,649	xxxx
—All other	5	7	392,000				xxxx	16,799	26.5	15,310	xxxx
Splice bars and tie plates	12	8	1,745,960				xxxx	51,998	18.4	56,395	xxxx
Track spikes	10	9	349,400				xxxx	13,417	23.8	13,964	xxxx
Hot Rolled Bars—Carbon	34	10	xxxx		xxx			603,837	xxx	521,045	67,948
—Reinforcing—New billet	13	11	xxxx		xxx		xxxx	72,425	xxx	86,406	xxxx
—Rerolled	13	12	xxxx		xxx		xxxx	13,753	xxx	14,021	xxxx
—Alloy	21	13	xxxx		xxx			138,944	xxx	117,636	11,518
—Total	40	14	21,936,660					828,959	23.4	739,108	79,466
Cold Finished Bars—Carbon	24	15	xxxx		xxx		xxxx	132,305	xxx	135,405	xxxx
—Alloy	21	16	xxxx		xxx		xxxx	21,735	xxx	18,725	xxxx
—Total	31	17	2,848,110				xxxx	154,040	33.5	154,128	xxxx
Tool steel bars	18	18	255,010				xxxx	11,596	28.1	12,279	xxxx
Pipe & Tubes—Butt weld	14	19	2,176,520				xxxx	116,840	33.2	126,008	xxxx
—Lap weld	8	20	730,200				xxxx	19,545	16.6	28,025	xxxx
—Electric weld	11	21	1,581,900				xxxx	79,104	30.9	71,271	xxxx
—Seamless	14	22	3,367,600				xxxx	161,445	29.7	132,871	xxxx
—Conduit (cap. & prod. incl. above)	5	23	xxxx	xxxx	xxx		xxxx	xxxx	xxx	9,184	xxxx
—Mech. tubing (cap. & prod. incl. above)	12	24	xxxx	xxxx	xxx		xxxx	xxxx	xxx	33,364	xxxx
Wire rods	26	25	7,293,670					389,943	33.1	103,815	40,959
Wire—Drawn	41	26	5,708,890					313,969	34.0	184,468	11,867
—Nails and staples	18	27	1,260,360				xxxx	51,329	25.2	50,862	xxxx
—Barbed and twisted	15	28	543,610				xxxx	21,121	24.0	20,341	xxxx
—Woven wire fence	15	29	1,121,860				xxxx	41,669	23.0	41,071	xxxx
—Bale ties	12	30	149,700				xxxx	6,922	28.6	8,033	xxxx
Black Plate—Ordinary	9	31	xxxx	xxxx	xxx			xxxx	xxx	95,099	330
—Chemically treated	8	32	465,000				xxxx	16,612	22.1	15,388	xxxx
Tin and Terne Plate—Hot dipped	9	33	3,758,850				xxxx	152,749	25.1	182,474	xxxx
—Electrolytic	9	34	2,231,850				xxxx	69,871	19.4	84,460	xxxx
Sheets—Hot rolled	30	35	19,353,320					1,234,399	39.4	527,389	34,477
—Cold rolled	13	36	7,127,460				xxxx	565,347	49.1	399,186	xxxx
—Galvanized	16	37	2,924,130				xxxx	146,628	31.0	152,071	xxxx
Strip—Hot rolled	24	38	7,215,030					219,331	18.8	160,326	22,252
—Cold rolled	35	39	3,085,450				xxxx	131,074	26.3	136,911	xxxx
Wheels (car, rolled steel)	5	40	315,400				xxxx	23,635	46.3	23,969	xxxx
Axles	6	41	398,170				xxxx	10,401	16.2	8,976	xxxx
All other	3	42	169,510				xxxx	5,197	19.0	4,341	xxxx
TOTAL STEEL PRODUCTS	145	43	xxxx	xxxx	xxx			xxxx	xxx	4,783,699	404,962
Effective steel finishing capacity	145	44	64,059,000	xxxx	xxx	xxxx	xxxx	xxxx	xxx	xxxx	xxxx
Percent of shipments to effective finishing capacity	145	45	xxxx	xxxx	xxx	%	xxxx	xxxx	xxx	42.3 %	xxxx

During 1944 the companies included above represented 99.0% of the total output of finished rolled steel products as reported to American Iron and Steel Institute.

Maximum Annual Potential Capacity: Embraces the total tonnage of each product that could be produced under full operations, assuming exclusive use of all available facilities and without regard to the availability of ingots. For those types of rolling mills and other producing facilities which produce more than one product, the full capacity for each product is shown, regardless of the fact that such producing facilities have not capacity to produce the aggregate tonnage shown for all such products. As an illustration, for a continuous strip-sheet mill producing both plates and sheets, the full capacity of the mill to produce each product is included, regardless of the other product.

Weekly Gallup Polls

Narrow Margin Wants Bikini Bomb Tests Held

Princeton, N. J.

• • • **Public opinion in** this country is sharply divided today on the question of whether or not to hold the atomic bomb tests, scheduled at the Bikini Atoll this summer, according to George Gallup, director, American Institute of Public Opinion.

In the face of many rumors that the atom bomb tests were to be abandoned, President Truman recently affirmed the government's intention of going through with "operation crossroads." The tests, he holds, are essential to intelligent planning for the future.

In Congress, legislators have meanwhile tabled a resolution introduced by Senator James W. Huffman, D., Ohio, calling for abandonment of the tests. Senator Huffman has indicated he intends to push for passage of the resolution.

Field reporters for the institute put the issue to the voting public as follows:

"Do you think the United States should carry out the atom bomb tests on Bikini Island, or should this be given up?"

Replies across the nation:

	Pct
Hold the tests	43
Call off the tests	37
Undecided	20

When replies to the question are limited to World War II veterans, the picture is different. Virtually two out of every three among the vets want the tests held.

A breakdown of the findings by educational background reveals a majority of people who have attended college or high school favoring going through with the project. When it comes to people with grammar school training or less, more are opposed than favor having the tests held.

These facts are shown in the following tables:

World War II Veterans

	Pct
Hold the tests	65
Call off the tests	25
Undecided	10

By Education

	College Trained	High School	Grammar or no school
	Pct	Pct	Pct
Hold the test	53	52	35
Call off the tests	36	32	40
Undecided	11	16	25

Some of the people favoring the idea of holding the Bikini project as scheduled say they think it will provide essential information to future defense and to science. Others say the bombing will provide an effective show of American power.

There are three principal reasons people give for opposing the tests: The first is that the scientists are fooling with something that may get out of control and blow up a large part of the world. The second is that the tests won't prove anything. The third is that the tests are an unnecessary show of power and can only result in hard feelings toward the United States.

Present plans call for animals on the ships at Bikini in order to test the effect of the bomb on living creatures.

On the question of whether or not the animals should be used, the American public is evenly divided.

The question asked of voters in this connection:

"Some persons say that animals should not be used in making atom bomb tests at Bikini Island. Do you agree or disagree?"

	Pct
Think animals should be used	42
Think animals should not be used	42
Undecided	16

On this question as on the question of holding the tests, a majority of World War II veterans and a majority of people who have attended college want to see the animals used.

Opposition to using the animals is most general among women and among those with grammar school training or less.

Use of Animals in Test Causes Even Split in Public Opinion; Return to Rationing Acceptable

o o o

The vote on the issue among the various groups:

	Think animals should be used	Should not	Undec.
By Sex	Pct	Pct	Pct
Men	47	40	13
Women	37	43	20
By Education			
College	53	34	13
High school	46	42	12
Grammar or no school	36	44	20
World War II veterans	53	36	11

• • • **A majority of the** American people stand ready and willing to return to food rationing, if need be, to help feed the needy in Europe and Asia.

There are, of course, many practical considerations standing in the way of the return to consumer rationing. These have been pointed out by Secretary of Agriculture Clinton P. Anderson and others. For example, while the needs of Europe's starving are immediate, it would take weeks, it is said, to reestablish rationing boards.

The present findings are very important, however, as a measure of the extent to which the people of this country are willing to go in lending a hand.

Former Mayor Fiorello LaGuardia, director of UNRRA, has declared that a voluntary program is not adequate and has urged that President Truman use his war emergency powers to sign an order setting aside 25 pct of all wheat grain delivered to the mills.

The question in the present poll:

"Would you be willing to go back to food

(CONTINUED ON PAGE 165)

More Shiploads of War Surpluses to Arrive Here by Mid-Summer

Washington

• • • **By the end** of July, 125 additional shiploads of war surpluses, largely of civilian type items worth around $350 million, will have been returned to the United States from the war theaters, it is estimated by Under Secretary of War Kenneth Royall.

These will consist of any new or serviceable items for which shipping space is available as opposed to a former War Dept. policy of shipping only needed military items plus a specified list of critically needed civilian-type commodities.

Army activity in connection with disposal of overseas surpluses is 75 pct completed, Royall said on his return from an inspection trip to all war areas. Less than $4 billion worth of surpluses out of a total of $15.3 billion (exclusive of material retained for military use) remains for the Army to act upon one way or another, he said.

Approximately $5.75 billion worth of property has already been returned, he said. This consisted mainly of military type items such as aircraft, guns, ammunition, etc. In addition, the Army has destroyed about $1.66 billion worth of military items not needed for salvage in order to prevent acquisition and possible use for lethal purposes in the future.

In addition, more than $4 billion worth has been declared surplus by the Army, leaving a probable $2½ billion to be declared. It is anticipated that $800 million will be shipped back to the United States and an additional $880 million worth of purely war material will be destroyed. Approximately $500 million worth of goods has been sold in the theaters, including emergency sales in West China where the property could not be properly cared for and guarded.

It was revealed that relatively little of the material on isolated islands, including $1 billion worth on Iwo Jima and Okinawa, is recoverable because of the lack of port facilities.

"All this was landed on the beaches (by barge) largely under fire. . . . You cannot do anything about loading without serious risk to human life. The War Dept. is not going to recommend risking any more lives in removing this property," Under Secretary Royall said.

OVERSEAS SURPLUS PROPERTY

Figures Provided by Under Secretary Kenneth C. Royall, 4/22/46

(in $ millions)

Disposed of overseas	$ 500
Returned to United States	5,750
To be returned	800
Declared surpluses	4,000
To be declared	2,250
Destroyed	1,160
To be destroyed	880
Total Overseas	$15,340

The Mead special Senate committee estimated that as of Jan. 1, 1946 the overseas inventories, including installations, amounted to roughly $24 billion of which it anticipated $14½ billion surplus. The committee placed total war production at $316 billion, of which $100 billion was shipped overseas for our own forces and $46½ billion to the Allies under lend-lease.

MORE POWER TO YOU: *Rough forging, weighing 75,000 lb, for the generator shaft of the 100,000 kw turbine generator under construction in the Schenectady works of General Electric for Public Service Electric & Gas Co. of New Jersey is handled by a shop crane. The generator will be the largest 3600 rpm machine ever built up to the present time.*

Ore Prices May Be Adjusted

Washington

• • • **Pointing out that** an immediate decision on new Lake iron ore prices cannot be reaced because of uncertain factors and the peculiar seasonal nature of the industry, OPA has authorized producers to enter into adjustable price agreements. Under the agreements purchasers are allowed to receive ore at prices to be adjusted upward after delivery. Price adjustments have been under survey for some time by the OPA iron ore industry advisory committee. Increased ceilings are expected to be announced in a week or so due to higher costs arising from wage boosts.

Bolt and Nut Prices Raised

Washington

• • • **Resellers of bolts,** nuts, screws and rivets will be permitted to pass along the 7 pct increase in prices granted to producers of these products. Formal OPA announcement of this action is expected this week.

Pressed Metal Group Holds Annual Meeting; Custer Made President

Cleveland

• • • **Election of** Clarence W. Custer of American Stamping Co. as president of the Pressed Metal Institute was announced at the annual meeting of the Board of Trustees held in Cleveland. Following the election of executive officers, reports were made by the various standing committee chairmen and a program of institute activities for the coming year was presented.

Clarence W. Custer

Commenting on the important contribution made by the Pressed Metal Institute to the stamping industry, Mr. Custer said: "Through the Pressed Metal Institute the industry has been able to cope collectively with the problems that could not otherwise have been solved successfully.

"Cooperation with the OPA resulted in better understanding and constructive action, making possible enhanced production. With the cooperation of the Industry Advisory Committee, the institute has been able to overcome a number of handicaps due to poorly coordinated price controls.

"The labor shortage and attendant labor difficulties are beginning to clarify but material and tools are still in very short supply, a situation that deserves earnest consideration by those to whom the industry must look for the tools and raw materials of production.

"If labor and materials problems can be solved through cooperation there is little else that can deter the pressed metal industry from resuming full peacetime production, and even surpassing the astounding stamping output of the past five years."

Other newly elected officers include: Carter C. Higgins, vice-president of Worcester Pressed Steel Co. as vice-president; J. J. Boehm, president of Boehm Pressed Steel Co. as secretary-treasurer; Tom J. Smith, Jr., as executive vice-president.

Present trustees of the institute are: F. C. Greenhill, Acklin Stamping Co.; Walter T. Baird, Toledo Pressed Steel Co.; Wilfred Williams, Acklin Stamping Co.; Glendon H. Roberts, Detroit Stamping Co.; N. J. Nolan, Advance Stamping Co.; R. K. Follansbee, Sheet Metal Specialty Co.; Charles F. Elmes, Elmes Engineering Works; Walter C. DeMaris, Heintz Manufacturing Co.; Harry H. Cutler, Cutler Metal Products Co.; Harvey S. Johnson, Metal Specialty Co.; Carter C. Higgins, Worcester Pressed Steel Co.; H. E. Hill, Waterbury Buckle Co.; S. Morrison, Morrison Steel Products, Inc.; Wm. H. Miller, The Bossert Co.; Clarence W. Custer, American Stamping Co.; J. A. MacMillan, Geometric Stamping Co.; R. F. White, Mullins Mfg. Co.; Kenneth T. Norris, Norris Stamping & Mfg. Co.; R. W. Glasner, Clearing Machine Corporation; G. F. Ahlbrandt, American Rolling Mill Co.

OPA Announces Price Rise Averaging 7 Pct For Malleable Castings

Washington

• • • **Ceiling prices for** malleable iron castings have been increased on the average 7 pct. To encourage production by customary prewar producers, the increase is applied in varying amounts depending upon the periods in which present price levels were fixed, the Office of Price Administration has announced.

The increases, effective Apr. 26, follow:

(1) For castings, the maximum prices of which were frozen at base period, Oct. 1-15, 1941, levels—25 pct.

(2) For castings, the maximum prices of which were formulated between Oct. 21, 1942, and Dec. 31, 1943—14 pct.

(3) For castings, the maximum prices of which were formulated between Jan. 1, 1944, and Dec. 31, 1944, and for castings for which producers chose to use their prebase period prices—6 pct.

(4) For castings, the maximum prices of which were formulated between Jan. 1, 1945, and Dec. 31, 1945—2 pct.

The increases were said to be calculated to restore to the industry its base period rate of return on net worth for the next 12 months. They will bring the cost-price relationship of the various price levels into closer alignment with each other and should restore production to more normal and experienced sources of supply, the agency said.

The action revokes all adjustment orders for companies that elect to add the appropriate new percentage to their base period or formula price levels. However, it permits producers to use their present price levels including individual adjustments without today's increases if they prefer. It permits producers to apply in the future for individual adjustments of their maximum prices as in the past. However, OPA added, there will be no further need for the interim procedure for processing individual applications based on approved wage increases. Hence, this method is suspended.

50-Yr Ore Contract Let

Cleveland

• • • A 50-yr contract for exploitation of newly-discovered iron ore deposits in Brazil has been awarded M. A. Hanna Co., it was announced Apr. 26, in Rio De Janeiro, according to associated press dispatches.

The new deposits, which contain an estimated 160,000,000 tons of iron ore, are located in Amapa, a Brazilian Federal Territory, on the Northern Coast of Brazil.

According to a company official, the ore is of high quality, and exploration drilling will start sometime this summer. M. A. Hanna Co., it was reported here, plans to build a railroad into the new iron ore district and will be the first to mine the area.

H. L. Pierce, of M. A. Hanna Co., has been conducting the company's iron ore exploration in Brazil, and the company has been checking the country North of the Amazon River for the past year.

New Stout Motor Car Uses Fiber Body And Rear Engine Design

Detroit

• • • **William V. Stout** has unveiled for the press the "Stout Forty-Six," a passenger car for the postwar era which uses no body steel and incorporates a number of unusual engineering and design features including engine in the rear, air cushion springing on all four wheels, extra long wheelbase and unusual roominess for passengers. Mr. Stout explained that the present car is not a production model, that there is no weight saving in the present model as compared with conventional cars utilizing all-steel bodies and that no present producer of motor cars has made licensing arrangements with William B. Stout as an individual, Graham-Paige Motors Corp., Consolidated-Vultee Aircraft Corp. and Owens-Corning Fiberglas Corp., who hold jointly the patents covering the new design features.

Except for the doors, the entire body of the car, including floor, roof, sides and ends is built of one piece of fiberglas plastic. When asked about the properties of this plastic, Mr. Stout stated that in addition to its ability to be molded, the material insulates against both heat and noise, and has 10 times the impact strength of steel. Tensile strength of the fiber material was given as 300,000 psi, a figure which evoked amazement among engineers who were present at the demonstration.

The material takes a finish similar to enamel on steel and, according to Mr. Stout, can be repaired by applying a heat lamp to fuse a patch of suitable size. It was further explained that at the present time fiberglas plastic cannot be produced on a commercial basis because curing time required for the molded bodies is too long.

Overall length of the present model is 190 in., which is similar to the Ford, Chevrolet or Plymouth cars. Passengers are seated between the wheels and the unusual type air cushion springing permits the car to ride with exceptional smoothness over rough roads.

A curved windshield, equipped with a wiper of special design gives the motorist unobstructed front and side vision and has the additional effect of eliminating wind roar and drafts inside the car.

The driver's seat is fixed to the floor and is adjustable, fore and aft, to provide driver comfort. The rear seat of the car can be made up, Pullman style, into a double bed while traveling.

Mr. Stout explained that advantages of engine-in-the-rear design include increased weight over the rear wheels, thus giving better traction in mud or on ice.

The body lines of Scarab, built 10 yr ago, are evident in the new Stout design. Heater, horn and spare tire are under the front hood. The bumper, which is faired into the contours of the car, runs all around the car, offering protection to the sides as well as front and rear. A minimum of chromium is used.

The present powerplant of the Stout is that of the Scarab although a new powerplant, weighing 400 lb less than the present model is being developed, according to Mr. Stout. The body was built by Owens-Corning Fiberglas Corp. at Newark, Ohio; engineering work was done at the Graham-Paige plant in Detroit.

Mr. Stout continues his connection with Consolidated-Vultee Aircraft Corp. and associated with him in the new development as design engineer is Louis A. Werner.

Resellers Can Add Extras

Washington

• • • **OPA expects to** announce four changes in pricing provisions for warehouse sellers of prime hot-rolled and cold-rolled sheet steel and strip within the next week. The changes will permit warehouse resellers to:

(1) Include in their maximum prices the appropriate extras for products made from selected rimmed stock or aluminum killed steel.

(2) Include in their maximum delivered prices the amount by which truck delivery costs exceed freight in cases where deliveries are made by truck at the request of the buyer.

In addition, the wartime provision permitting addition to Pacific Coast resellers maximum prices of the additional costs of overland rail transportation will be eliminated.

PIG IRON SCARCITY: *For the third time in the past six months, the supply of pig iron is being drastically curtailed by strikes. Last October the mine strike cut output and before supplies could be built up, the steel strike early this year again shut down blast furnaces. Production for March which stood at 77.3 pct of capacity took a sharp dip in April.*

Blast Furnace Capacity and Production—Net Tons—Source: American Iron & Steel Institute

	Number of Companies	Annual Blast Furnace Capacity	PRODUCTION							
			PIG IRON		FERRO-MANGANESE AND SPIEGEL		TOTAL			
									Pct of Capacity	
			March	Year to Date	March	Year to Date	March	Year to Date	March	Year to Date
DISTRIBUTION BY DISTRICTS:										
Eastern	12	12,988,970	774,957	1,375,634	14,385	28,120	789,342	1,403,754	71.5	43.8
Pittsburgh-Youngstown	15	25,939,940	1,830,689	3,242,480	15,132	19,403	1,845,821	3,261,883	83.8	51.0
Cleveland-Detroit	7	6,557,500	460,106	883,424	.....	.....	460,106	883,424	82.6	54.6
Chicago	7	14,093,510	901,243	1,770,026	.....	.....	901,243	1,770,026	75.3	50.9
Southern	9	4,924,670	309,457	647,577	10,342	17,421	319,799	664,998	76.4	54.7
Western	5	2,836,000	107,605	231,947	.....	.....	107,605	231,947	44.7	33.2
TOTAL	36	67,340,590	4,384,057	8,151,088	39,859	64,944	4,423,916	8,216,032	77.3	49.5

Eastern Cooperative Foresees Little Competition for Steel in Farm Use

By S. H. BARMASEL

Ithaca, N. Y.

• • • **If the prospect of** competition from other materials has discouraged any member of the steel industry, he has but to talk to the Cooperative Grange League Federation Exchange, Inc., here, to have the gloom expelled. Steel is still king, according to present thinking of this group.

However, the shortage of galvanized sheets has stimulated several research projects as to the serviceability of aluminum sheets for roofing and similar uses. Field tests on equipment made of both aluminum and steel are now being run. Until the results of these tests are available, which in many instances may take years of observation, GLF intends following a conservative course in its recommendations.

A previous article on GLF activities appeared in THE IRON AGE, *Aug.* 10, *p.* 101.

While the prime functions of this cooperative does not center around the work of its research section, some of the most interesting developments have stemmed from its work. About 10 yr ago, GLF with the cooperation of the American Society of Agricultural Engineers and the American Society of Testing Materials conducted tests to determine the advantages of 2-in. zinc coatings over 1-in. coatings. This finally led to the elimination of specifications calling for 1-in. thick coatings. In about 2 yr they expect to produce some interesting data of hot-dipped and electrolytic zinc coatings. This series of experimentation is now in the works but it is felt that it is still too premature to publish the findings.

But GLF's research activities are not confined to its own independent studies. Manufacturers of farm equipment have enlisted its cooperation to discover just what the farmer wants in his equipment. In converting the jeep from military to agricultural use, for example, Willys-Overland asked GLF to put several jeeps on the farms of its members to see how they would act under actual farm service conditions. It was thus found that the Army jeep was not entirely adaptable to farm use. Axles were not heavy enough; the transmission would not stand up under constant rigorous use, and the farmers wanted a little more comfort than was afforded the GIs.

While the changes that were incorporated into the farm jeep came as a result of GLF active participation in the problem, GLF takes no part in its marketing. However, when the Carrier Corp. proposed a similar study for a farm freezer, the freezer that was developed through farm suggestions received the GLF label.

The research department with its electrical, mechanical, home economics, chemical and quality control laboratories comes under the Farm Supplies Division. This division acts as purchasing agent and warehouse for GLF members. Last year its purchases totaled $12,651,000. This figure includes among other items such finished steel products as wire, fence posts, bale ties, roofing and netting; farm equipment like milkers, coolers, sprayers and freezers; tires and petroleum. In 1946 GLF expects to spend about $750,000 for finished steel items. It would like to buy more, but shortages cramp its style.

To house these purchases GLF maintains seven warehouses located at Caledonia, Oneida, Owego, Canton, Albany and Port Jervis, N. Y., and Warren, Pa. These warehouses make weekly deliveries to its approximately 700 stores, each warehouse servicing about 100 stores. Prices in these stores closely parallel prices in independent hardware stores in the community. But distribution and overhead savings are passed on to GLF patrons in the form of dividends.

Last year about 109,000 farmers purchased or marketed through GLF to the extent of $100 or more; 60,000 owned stock in the cooperative.

For the fiscal period ended June 30, 1945, GLF handled a total volume of $110,491,000 including both marketing and purchasing operations. This it does not expect to reach for the period ending June 30, 1946, because of the serious shortage of feed, principal commodity handled by GLF.

Acquires Louisville Plant

Chicago

• • • **International** Harvester Co. has reached an agreement to purchase the government-owned former Curtiss-Wright plant at Louisville, and has applied for permission to proceed with a $10,650,000 expansion and improvement program for farm equipment. Indicated price paid by Harvester for the plant was $6,700,000 compared to original cost of about $13 million.

NO DRIVER NECESSARY: *This tractor with a two-wheel guide is said to practically do away with the need for human labor in plowing a field. The guide keeps the machine following a furrow; if it should jump the furrow the power is automatically cut off. F. O. Masten, the developer, claims one man can "ride herd" for several tractors being run at the same time.*

Czech Nationalization Program Developing Under Eleven Heads

London

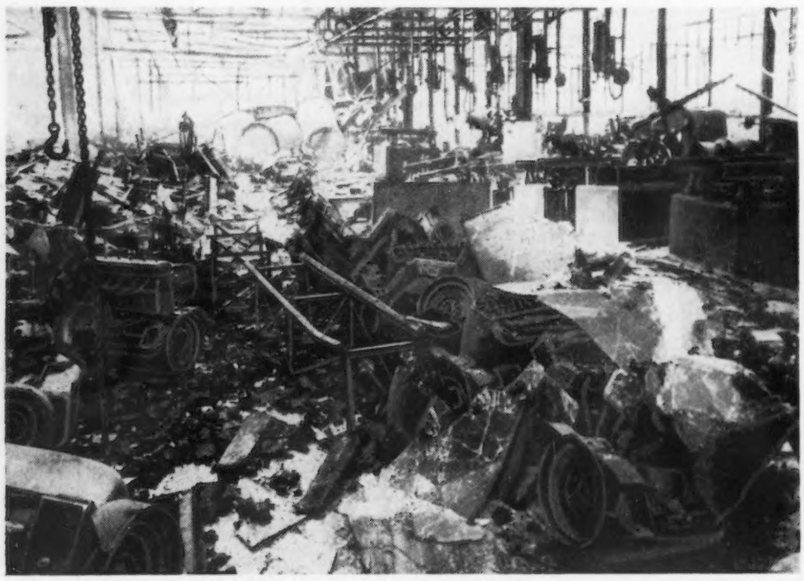
• • • **Nationalization of** industries in Czechoslóvakia under the nationalization decree of October 1945 has been proceeding rapidly, according to a report in the *London Economisi*. It has now reached its second stage by publication of a statute relating to national industrial and business concerns, and eleven complete directorates and administrations for nationalized industries have already been set up. They control iron and steel works, the mining industry, power stations, the chemical industry, and the glass, ceramic, and paper and cellulose industries.

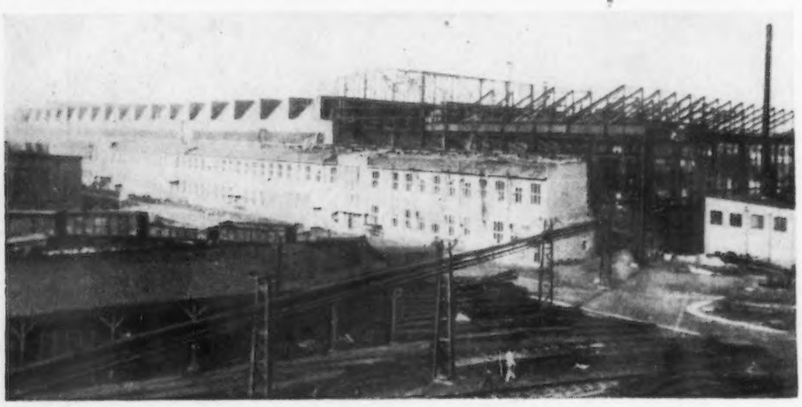
Compensation of foreign capital assets in Czech industries is likely to prove a difficult problem. German assets, which are reported to have increased tenfold during the war, have been confiscated. British capital interests are concentrated in the iron and steel works of Vitkovice, margarine and chemical works at Usti, and in the chemical industry, while the United States and most of the leading continental nations hold interests in Czech industries as well. The investigation of the exact amount and distribution of foreign capital assets in Czechoslovakia should be completed soon.

During the period of liberation and the first months of peace no accurate account of the country's industrial activity could be given. Official sources estimate economic activity at the beginning of 1946 at around 50 pct of the prewar level.

This optimistic estimate appears to be confirmed by statistics regarding the coal industry, where in January 1945 output had reached 1.8 million net tons, or 109 pct of the January 1937 output. This is a remarkable achievement, as during the German occupation the mines were worked to death without proper regard to maintenance. At this production rate Czechoslovakia is self-sufficient in coal. Coal imports and exports roughly balanced each other prewar, and in proportion to the size of the industry exports of coke were considerable.

The shortage of miners will probably be overcome by employment of Slovaks, and such necessities as suitable explosives, mining machinery, winding-gear, belting, etc., which are at present very scarce, will be supplied by UNRRA. The German-built synthetic fuel plants will be reduced in size, probably owing to the high production costs, but exploratory drilling for natural oil in the Oelmuetz area is to be resumed.





TARGET FOR YESTERDAY: *The photograph above shows the ruins of the Skoda works at Pilsen, Czechoslovakia after allied airmen had finished their job. Below, a new Skoda works emerges from the rubble of war. This sprawling factory is the same plant as it appears today.*

Forecasts Bright Outlook

Pittsburgh

• • • **A large and profitable** business, both domestic and foreign, extending over several years, is envisioned by F. C. Biggert, Jr., chairman of the board of United Engineering & Foundry Co. He told stockholders of the company at the annual meeting, Apr. 23, however, that operations thus far this year have been affected by various strikes.

However, he said, it is evident that present high wage rates can be fully compensated only by higher prices, and he indicated the belief that when pentup demand is completely evident the necessary price adjustments will occur notwithstanding that competitive conditions at present fail to reflect the realization that increases must develop. He said that when the company resumed full production after the general steel strike, management noted improvement in both quantity and efficiency of production.

Discussing long-range prospects of the company, Mr. Biggert said, "there is world-wide inquiry and large business requires only a stabilized political and monetary situation."

The London ECONOMIST

Before the Paris Conference

Reprinted by special permission to further understanding on how political and economic affairs are viewed in London.

° ° °

EIGHT months have passed since the first meeting of the Foreign Ministers. During this time there has been a steady deterioration in the relations between the Great Powers, hardly arrested by the various agreements reached in Moscow in December. Since not one of these agreements has led to the desired results, it may even be that the December Conference accelerated the Allies' descent into the present slough of suspicion, irritation and disunity. The proposed broadening of the government did not take place in Bulgaria. In Rumania, the addition of two opposition members to the cabinet has simply exposed two powerless men to the merciless public attack of their colleagues. In the Far East, the evacuation of Manchuria hangs fire, the Korean government is not reconstructed and as a background the civil war in China goes on. Only in the Middle East—unmentioned at the Moscow Conference—has there been some slight slackening of tension.

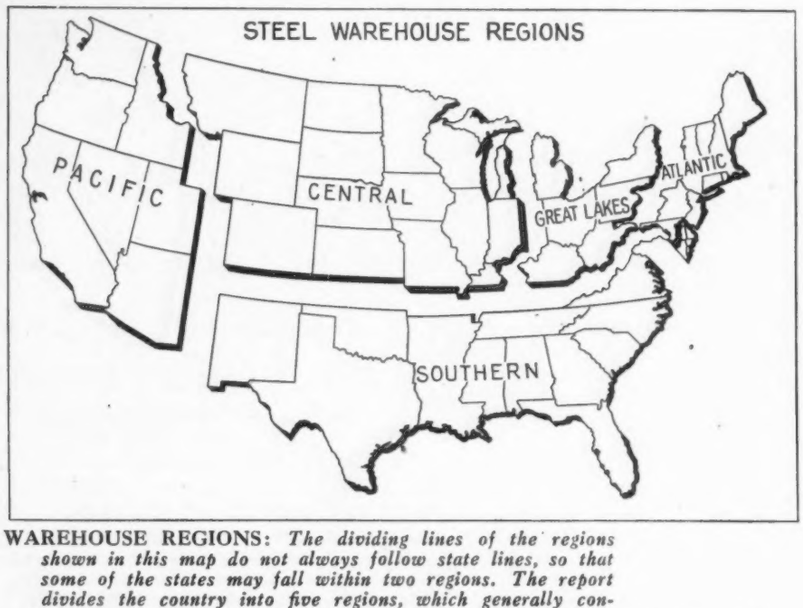
This direct and detailed disagreement has been accompanied by a general dour hostility. In Germany, it takes the form of the struggle to carry the Russian-sponsored Communist-Socialist fusion into the western zone; in France it is fierce opposition to closer relations between the Western Powers; in Italy it is the Communist cry that Britain must be driven from the Mediterranean (*mare nostrum* translated into Russian). And Moscow radio fills up the measure by constant and bitter attack on British policy, British interests and British intentions. How is it possible, in these circumstances, to pretend that the Russians wish for friendly cooperation? What conclusion can be drawn but that their policy is built on invincible hostility and implacable distrust? Why, then, should Mr. Bevin and Mr. Byrnes undertake yet another fruitless pilgrimage? Is it not better that the British and Americans should face facts realistically and, abandoning the search for an agreement that is never reached, concentrate on their own rights and interests?

THIS, however, is the reaction not of statesmanship but of irritation, and the stakes are too great for petulance. It is precisely during this year, when postwar misery is mounting in its climax and when the armies of the Powers are still not finally demobilized, that the threat of war must be held at bay. For if not a threat of war, at least a fever of expectation hangs over Europe. The belief—incredible though it is—that the Russians and the British are destined to fight before the year is out is a factor of turbulence and disintegration from one end of the Continent to the other. It prevents economic reconstruction. Why rebuild, if the armies will pass this way tomorrow? It prevents political pacification. Why be conciliatory, if your "friends" may cross the frontier next week? It polarizes the division between Left and Right, East and West. It tempts the Communists to greater excesses. It rallies an unsavory *avant garde* of reactionaries and *déclassés* under the banner of anti-bolshevism. If at this point an open breach were to occur between Russia and the Western Allies, it might very well be the signal for civil strife in more than one European country, in the hope of speedy intervention from one set of Powers or the other. The Conference in Paris next week is not only or not even primarily an opportunity for adjusting Great Power differences. It is Europe's sheet anchor against the gale of hostility raging across the Continent.

Yet to say there must be no open breach is one thing. To secure a workable compromise is another. The Russians may possibly be ready to cooperate on their own terms, but they have not, hitherto, shown very much interest in the terms proposed by others. Cooperation cannot be achieved by full-scale appeasement. The Russians should not be exposed to the temptation of finding open every door at which they may kick. Mr. Bevin and Mr. Byrnes do not need so much to retreat from their own interests as to re-examine them in the light of Russian hostility and to determine where appeasement (in the genuine sense of conciliation) is still possible and where they must stand firm. Ideally, such an examination should be conducted dispassionately and factually with the Russians themselves. At no time, probably, have the Foreign Secretaries sat down together to discuss with complete frankness what their inalienable interests are or to find out whether there is any social and political order in Europe on which they can agree.

TEMPERAMENTALLY, the present Foreign Secretaries are too far apart to make the attempt and probably suspicion and hostility have gone too far to make agreement possible. What remains is the drawing up by Britain and the United States of their own diplomatic balance-sheet, in which they would define three categories of problems or interests—the first, those in which they consider Russia's concern to be paramount; the second, those in which negotiation and compromise are possible and useful, and the third, those in which the Russians be accorded

(CONTINUED ON PAGE 165)



WAREHOUSE REGIONS: *The dividing lines of the regions shown in this map do not always follow state lines, so that some of the states may fall within two regions. The report divides the country into five regions, which generally conform to the natural steel warehouse market areas which show significant differences in the type of products handled.*

• • •

TABLE A

Shipments of Steel Products from Warehouses, by Region, By Product, 1944

PRODUCT	TONNAGE SHIPPED	PCT SHIPPED IN REGION					
		United States	Atlantic States	Great Lake States	Central States	Southern States	Pacific States
Total Steel Products	7,299,982	100	22	24	27	14	13
Merchant Trade Products	3,102,000	100	16	16	24	27	17
Standard and line pipe and water well tubular products, and couplings	1,132,000	100	19	17	21	20	23
Oil country casing, tubing, drill pipe, and couplings		100	5	11	13	39	32
Tinplate, and terneplate (short ternes)	27,000	100	80	4	10	6	—
Galvanized, lead-coated or painted sheets and strip, formed roofing and siding, etc.	551,000	100	17	16	26	30	11
Nails (cut and wire), fence netting staples	1,392,000	100	17	15	21	29	18
Wire rope and strand		100	6	11	13	36	34
Wire, drawn		100	23	18	25	15	19
Wire bale ties		100	8	20	37	24	11
All other wire products		100	6	16	30	40	8
Fence posts		100	6	22	55	3	14
General Steel Products	4,197,982	100	26	30	29	5	10
Carbon	4,052,637	100	25	30	29	6	10
Structural shapes, etc.	600,367	100	27	25	27	9	12
Plates, incl. skelp	743,540	100	21	32	28	7	12
Rails and track accessories	35,470	100	3	66	14	11	6
Hot-rolled bars	923,783	100	28	22	28	8	14
Cold finished bars	307,551	100	26	30	32	4	8
Tool steel, drill rod	15,661	100	42	23	23	4	8
Mechanical tubing	58,118	100	23	35	34	1	7
Pressure tubing	37,293	100	41	22	19	10	8
Sheets and strip, HR	743,765	100	21	38	31	3	7
Sheets and strip, CR	404,389	100	30	34	34	(1)	2
Sheets and strip, all other	15,444	100	58	10	32	(1)	—
Tin mill black plate	75,548	100	19	24	44	11	2
All other carbon	1,708	100	2	16	6	19	57
Alloy, except stainless	121,697	100	25	31	27	2	15
Stainless	23,648	100	47	12	34	(1)	7

[1] Less than one half of one pct

Source of data on General Steel Products: Facts for Industry, 30-8-1.

Regional Warehouse

Cleveland

• • • **A statistical picture** of the wartime activities of distributors of merchant trade products, showing regional characteristics and representing more than 70 pct of the total tonnage of merchant trade products handled by warehouses, was recently unveiled by the Steel Div. of the Civilian Production Administration.

Based on a survey covering the continental United States during the period October 1942, through June 1945 the report divides the country into five regions generally conforming to the natural steel warehouse market areas, (see map) which show significant differences in the type of merchant trade products handled in each and in the regional operations of warehouses handling merchant trade and general steel products.

Included are data on steel distributors' shipments, receipts, and inventories of merchant trade products, as well as comparable data on these products during prewar periods. Statistics were compiled from reports submitted during the war period by approximately 2100 distributors of steel products, and while they represent more than 70 pct of the total tonnage of merchant trade products handled by warehouses, coverage shows considerable variation between different groups of products.

Coverage for tin and terneplate for most of the period covered by the report is virtually complete; for pipe, it varies between 76 pct and 81 pct; for galvanized, lead-coated, and painted sheets and strip, it varies between 74 and 81 pct; wire products coverage is lower than any other, ranging from 63 to 69 pct.

Regional differences are shown in table A, which presents the percentages of each steel product shipped by the warehouses in the different regions. For example, warehouses in the southern states, which shipped only five pct of all general steel products, accounted for 27 pct of all merchant trade products. In the Great Lakes region, the reverse was true, with only 16 pct of the merchant trade

Statistics Made Available By CPA Comprehensive Report

products shipped as compared with 30 pct of the general steel products. Major differences in the importance of these two groups of products also exist in the other regions.

While OPA's report estimates that there are more than 20,000 steel warehouses in the United States which handle merchant trade products, the great majority of these warehouses handle only a small quantity of merchant trade products and no reports were received from them. These companies consist principally of jobbers, wholesalers, and retailers that handle a variety of other products in addition to steel and are "steel warehouses" only as defined in OPA's report. Statistics in the report were compiled from data submitted by the larger warehouses, approximately 2100 being covered.

A quarterly report was received from distributors that received from steel mills tonnages of any one of the following product groups in excess of the quantity stated and during the base period specified as follows:

Product Group	Receipts from Steel Mills	Base Period
Pipe	240 tons	1940
Tin and Terneplate	240 tons	1940
Galvanized, lead-coated or painted sheets or strip	240 tons	1940
Wire products	240 tons	July 1, 1940 to June 30, 1941

In addition, reports were also received from any warehouse which received into stock more than 100 tons of merchant trade products during any quarter from the second quarter of 1944 to the second quarter of 1945. A company which was required to report because its receipts of a single product group were above the minimum requirements had to report its operations in all merchant trade products.

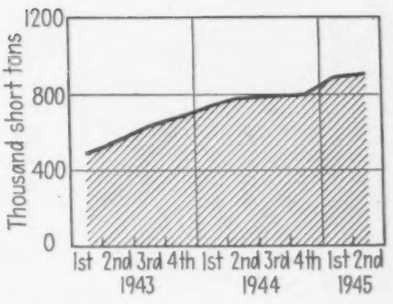
Table B shows the coverage of the warehouse statistics for the United States for each of the four groups of merchant trade products and for all merchant trade products.

Care should be taken when applying the coverage figures shown in table C for purposes of estimating total shipments, receipts, or inventories for all merchant trade

All Merchant Trade Products

(Thousands of short tons)

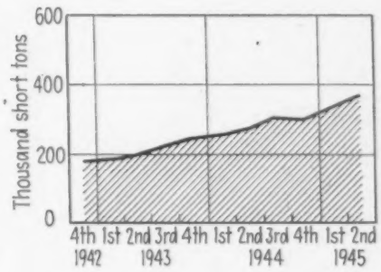
Period	Shipments	Receipts	Inventories
1942— 4th quarter	(b)	(b)	(b)
1943— 1st quarter	491	526	346
2nd quarter	559	643	423
3rd quarter	638	671	476
4th quarter	681	733	533
1944— 1st quarter	741	778	595
2nd quarter	778	758	562
3rd quarter	790	772	530
4th quarter	793	835	591
1945— 1st quarter	892	832	546
2nd quarter	908	871	488



Pipe

(Thousands of short tons)

Period	Shipments	Receipts	Inventories
1942— 4th quarter	179	177	152
1943— 1st quarter	183	192	163
2nd quarter	197	249	210
3rd quarter	221	247	243
4th quarter	244	254	254
1944— 1st quarter	251	272	295
2nd quarter	273	271	287
3rd quarter	309	297	271
4th quarter	299	317	287
1945— 1st quarter	331	316	282
2nd quarter	367	356	269



Tin and Terneplate

(Thousands of short tons)

Period	Shipments	Receipts	Inventories
1942— 4th quarter	1	2	11
1943— 1st quarter	1	3	12
2nd quarter	5	6	13
3rd quarter	5	5	14
4th quarter	7	6	13
1944— 1st quarter	6	5	12
2nd quarter	6	6	12
3rd quarter	7	6	11
4th quarter	8	8	14
1945— 1st quarter	7	7	12
2nd quarter	9	9	10

(b) Data not available.

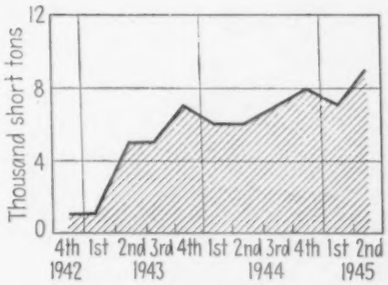


TABLE B

Coverage of Steel Warehouse Statistics on Merchant Trade Products, By Product Groups, October 1943-June 1945

PERIOD	PCT COVERAGE				
	Total Merchant Trade Products	Pipe	Tin and Terneplate	Galvanized, Lead Coated, and Painted Sheets and Strip, etc.	Wire Products
1943—4th quarter	74	81	99	81	66
1944—1st quarter	71	76	100	79	63
2nd quarter	74	79	100	79	67
3rd quarter	75	78	100	76	69
4th quarter	72	79	77	74	66
1945—1st quarter	70	76	100	74	64
2nd quarter	72	78	97	76	64

NOTE: The coverage for each quarter has been computed by compiling the tonnage, as reported on Form WPB-2633, Steel Producers Monthly Report, of merchant trade products shipped to warehouses and comparing the totals with the receipts by the warehouses as reported on Form WPB-2892. Comparable information for the period prior to the fourth quarter of 1943 is not available, but the coverage is believed to be similar to that for later periods.

product warehouses for any area other than the United States as a whole. Data are not available to permit estimates of the coverage in each region or state. It is known that some regions have a greater concentration of small warehouses than have others and because a cut-off method, based on the size of the warehouse, was used in determining the warehouses required to report, coverage figures that are accurate for the United States as a whole need not necessarily be the true percentages for a particular region.

Major product summary tables show for the United States as a whole estimates of shipments, receipts and end of quarter inventories of major merchant trade product groups from all steel warehouses, for the period October 1942 through June 1945. Regional distribution tables in the second section show for the United States and for each warehouse region, quarterly shipments, receipts, and inventories of all merchant trade products and of each product separately.

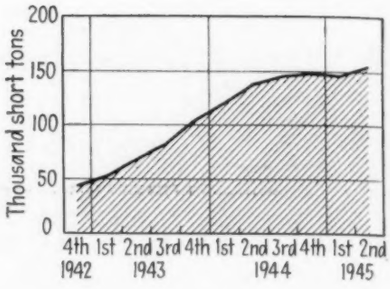
First base period table presents receipts of all merchant trade products except wire products during 1940 in the United States and in each region. The second base period table presents receipts of wire products for the period July 1, 1940, through June 30, 1941, in the United States and in each warehouse region. This period was selected as being more representative of the immediate prewar activity of this phase of the industry than the period chosen for the remainder of the products.

Data for the products classified as "wire (barbed and twisted), wire fence (welded and woven)," "wire netting," and "welded wire concrete reinforcing fabric" were combined in these tables, since no continuous series for this period of time were available for any of these individual products.

Galvanized, Lead-Coated, and Painted Sheets and Strip, Etc.

(Thousands of short tons)

Period	Shipments	Receipts	Inventories
1942— 4th quarter	43	54	33
1943— 1st quarter	52	64	45
2nd quarter	68	74	52
3rd quarter	82	75	48
4th quarter	104	98	43
1944— 1st quarter	120	123	45
2nd quarter	138	132	40
3rd quarter	145	143	39
4th quarter	148	150	43
1945— 1st quarter	146	149	47
2nd quarter	155	154	45

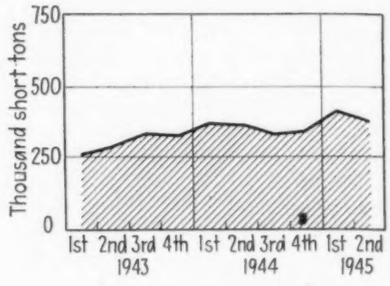


Wire Products

(Thousands of short tons)

Period	Shipments	Receipts	Inventories
1942— 4th quarter	(b)	(b)	(b)
1943— 1st quarter	255	267	126
2nd quarter	289	314	148
3rd quarter	330	344	171
4th quarter	326	375	223
1944— 1st quarter	364	378	243
2nd quarter	361	349	223
3rd quarter	329	326	209
4th quarter	338	360	247
1945— 1st quarter	408	360	205
2nd quarter	377	352	164

(b) Data not available.



Patent Office Due For Streamlining Treatment

Washington

• • • **Patent Commissioner** Casper Ooms has announced a program designed to streamline and simplify the rules and procedures of the Patent Office. A committee of Patent Office employees has been named to study and evaluate the rules, practices and procedures now in use with a view to formulating changes and revisions that may appear desirable. Matters requiring changes in the statutes will not be within the immediate scope of the committee's study. They will be studied by the Patent Survey Committee created by President Truman in April 1945.

Regarding a new simplified application form for use by inventors seeking patents, Mr. Ooms said that it will be limited to a single page and can be checked by Patent Office clerks much more quickly than the old form. The inventor can fill it out much more easily. He will be required to sign it in only one place instead of the three signatures called for in the old form.

The Patent Office is now deluged with a record number of applications that may number 100,000 this year. There is now a backlog of more than 106,000 applications awaiting action.

U.K. Tungsten Price Down

London

• • • **The issue price** of tungsten ore (other than high grade scheelite) has been reduced to $15.00 per unit of WO_3 delivered consumer's works in the United Kingdom, according to the British Ministry of Supply.

The price will continue to be $18.00 per unit WO_3 delivered consumer's works in the United Kingdom for special high grade scheelite to the following specifications: WO_3 minimum 68 pct, tin maximum 0.60 pct, arsenic maximum 0.10 pct, molybdenum maximum 0.10 pct.

Strikes Delay Building New Cold-Rolled Mill

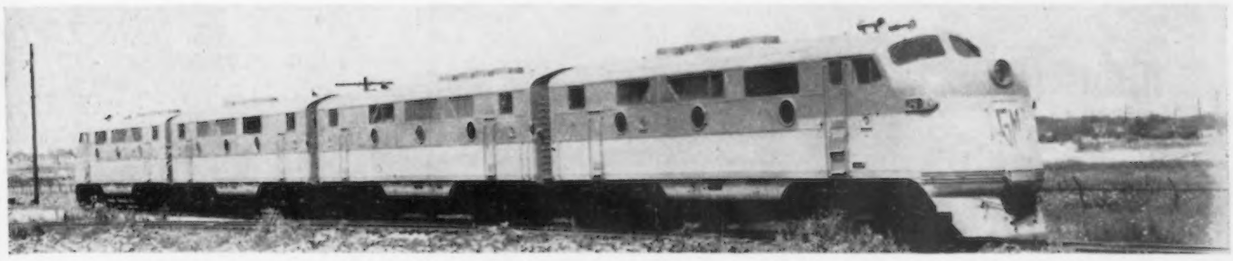
Detroit

• • • **Strikes have delayed** construction work on the new cold rolled mill planned for the Great Lakes Steel Co., here, and it probably will not get into operation this year, according to George R. Fink, president.

Completion of the new mill was originally scheduled for October. However, the strike of the CIO United Steel Workers union was the first delaying factor, and the lengthy Westinghouse Electric strike, cutting off the assembly of motors for this mill, has been another delaying factor of consequence.

It appears now that the mill will not be completed before next April, rather than October.

Costs, according to Mr. Fink and Ernest T. Weir, chairman of the company, which is a division of National Steel Corp., are running higher than original estimates.



Electro-Motive Swings into Full Output of Diesel Locomotives

Chicago

• • • **Just a month** after settlement of the General Motors strike, Electro-Motive Div. is swinging into full-scale production of diesel electric switching and line locomotives.

Major materials inventories constitute no problem, for the company had in its yards 260 carloads of steel and other items when the strike ended. Production has been restricted as operations gained slowly after the strike, resulting in material consumption at a low rate.

The slow resumption of production resulted to a great extent from failure to reach an agreement with the union allowing shutdown preparations and maintenance of equipment during the strike. Considerable rehabilitation was required before production could be resumed in several key departments. Only recently has employment reached pre-strike levels, with 40 and 48-hr work weeks alternated.

Although the company will not reveal backlogs, orders piling up at a rapid rate insure a long stretch of capacity production. Before the strike, an average monthly production rate of 52 freight, passenger and switching units had been reached, more than doubling the average prewar rate. Completion of Navy contracts more than a year ago allowed full facilities of the plant to be devoted to locomotive production, classified as essential during the war.

Lack of manufacturing space at the big LaGrange plant, for which ground was broken only 11 yr ago, constitutes the principal barrier to increased output. In addition to 1,750,000 sq ft of production space under roof at its own plant, Electro-Motive has leased about 250,000 sq ft for manufacturing purposes at the neighboring McCook aluminum plant, recently acquired by Reynolds Metals Co. A previously contemplated major addition to the main Electro-Motive manufacturing building was shelved because of high construction costs, it is understood. Electro-Motive now has under construction two smaller structures, a 60,000 sq ft test and paint building and a power plant. Both of these are located on a 125-acre site acquired a year ago adjoining the main plant. A three quarter mile double track test track has recently been placed in operation to supplement the previous one third mile test track at the plant.

Electro-Motive utilized more than a decade of experience in building rail cars, both by itself and a predecessor concern, in constructing the first diesel powered streamliner, Burlington's Pioneer Zephyr, in 1934, followed by the first successful separate mainline locomotive in 1936. Today, of about 43,000 locomotives of all kinds in service on American railroads, 3000 are diesel powered, both in switching and mainline service.

At the present rate of manufacture, about 20 yr would be required before substantially all the motive power of American railroads would be diesel—a goal which the manufacturers recognize as possible. Sales inroads already have been made in territories where other fuels are more abundant. The invasion of the coal belt hit a new peak last fall when the Pennsylvania ordered ten 6000-hp passenger locomotives to power its crack trains.

Now bidding for the heavy duty diesel locomotive business with Electro-Motive are American Locomotive Co., second in the field, Baldwin, and most recently, Fairbanks, Morse. The latter, which delivered its first unit, a switcher, about a year ago, and which since has built a number of switching locomotives, two weeks ago received its first big line locomotive order for five 6000-hp locomotives from the Chicago, Milwaukee & St. Paul. Fairbanks, Morse builds the diesel power plants at its Beloit, Wis., plant which are assembled with other components built by General Electric. FM now counts four distinct models in its line, including 1000-hp switching locomotives, 2000-hp transfer and road freight locomotives, 1600-hp general purpose locomotives for freight and passenger service, and streamlined freight and passenger locomotives in 2000, 4000 and 6000-hp combination.

Electrical Equipment Slows Plant Opening

Washington, Pa.

• • • **Electrical equipment,** supplies of which are being held up by the Westinghouse strike, has again pushed back the beginning of operations of the Washington Steel Co. Originally scheduled to start operations by mid-year, it appears now that the plant will not be able to get underway much before October.

It will probably be mid-summer before the rolling mill equipment, a Sendzimir type wide strip rolling mill, will be delivered, and it will take considerably more time to get the required electrical facilities into the plant and installed. Washington Steel Co. will produce extremely light gage stainless strip in widths up to 30 in.

Industrial Briefs...

• MOVES WESTWARD—Square D Co., Detroit, will build a new West Coast Div. plant in Los Angeles for the manufacture of control and electrical distribution equipment to replace the one now in operation. The new one story plant will expand by 60 pct the present facilities. J. H. Pengilly, vice-president of Square D, is general manager of the West Coast Div.

• OPENS SALES OFFICE—To better serve its tool steel customers in the Indianapolis territory, Vanadium-Alloys Steel Co., Latrobe, Pa., has announced the appointment of Arne Hedstrom to head its new Indianapolis office which was opened recently. The office will be located at 243 E. Ohio St., Indianapolis 4.

• NEW PILOT PLANT — The Mathieson Alkali Works has announced plans to build a $150,000 pilot plant at Niagara Falls. The steel is on hand for the building and construction will be started as soon as real estate negotiations are completed. This will be the company's second recent addition to facilities in the city.

• BRITISH AWARD — J. S. Hollings, C.B.E., director of Guest Keen Baldwins Iron & Steel Co. Ltd., Port Talbot, Glamorgan, Wales, has been awarded the Bessemer Gold Medal for 1946 by the Council of the British Iron & Steel Institute, in recognition of his distinguished services in encouraging technical improvement in the manufacture of iron and steel.

• FOUNDRY EXPANDS — The Chevrolet Grey Iron Foundry, Saginaw, Mich., is expanding its work area by approximately 50 pct, which will provide a corresponding increase in production. When completed, the foundry will employ more workers than at its prewar peak.

• ORDERS MOUNT—Graham-Paige Motors and Kaiser-Frazer Corp. have received orders from distributors totaling over $650 million for automobiles and farm equipment. The amount includes orders for 266,849 Frazer automobiles, 36,428 Rototillers and 396,995 Kaiser automobiles.

• OPENS NEW PLANT — United Steel Products, Inc., announces the opening of its plant and offices at 118 Grove St., Worcester, and will be engaged in the distribution and processing of flat rolled steel products.

• MOORE CORP. EXPANDS—Plant modernization plans for the Moore Corp., Joliet, Ill., manufacturers of combination ranges, gas heaters and furnaces, designed to quintuple production in 1 yr to 15 months without necessitating factory expansion, has been approved by directors of the parent concern, the Conlon Corp. A new line of electric ranges will be manufactured for distribution by Conlon, and virtually all present products will be redesigned.

• BUYS MORRISON STITCHING—Acme Steel Co., Chicago, has purchased the Morrison Stitching Machine Div. of Harris-Seybold-Potter Co., Cleveland, and Dayton. The Morrison line will be used to supplement and augment the present business of the stitching wire and machine division of Acme.

• FREIGHT CAR PLANT SOLD—H. K. Porter Co., Inc., has sold its Mt. Vernon Car Mfg. Co. div. plant at Mt. Vernon, Ill., to Pressed Steel Car Co. for $2,558,000. Included in the transaction is an agreement by which Porter has an option to supply all non-specific springs, forgings and castings, which Pressed Steel Car buys for a 10 yr period. With Porter's withdrawal from the freight car manufacturing field, the company's railroad division will concentrate on sale of specialties, it was announced.

Iron & Steel Engineers Plan Annual Spring Conference at Chicago

Pittsburgh

• • • **More than** 500 steel mill executives and operating engineers are expected to attend the annual spring conference of the Assn. of Iron & Steel Engineers, which will be held in the Congress Hotel, Chicago, on May 6 and 7. The meeting is sponsored by the rolling mill committee of the association. The sessions on May 6 will include three papers at the morning session, "The Art of Rolling Rounds," by C. P. Hammond, Atlas Steels, Ltd., Welland, Ont., "Roll Design for Die Rolling," by T. N. Sloan, Republic Steel Corp., Buffalo; and "Design of Mill Tables," by J. G. Meenan, United Engineering & Foundry Co., Pittsburgh.

The afternoon session will be a symposium on rolling mill bearings with the following papers: "Roller Bearings" by Paul Haager, Timken Roller Bearing Co., Canton, Ohio; "Metallic Bearings" by H. L. Smith, Federated Metals Div., American Smelting & Refining Co., Pittsburgh; "Composition Bearings" by W. A. Rankin, Gatke Corp., Chicago; "Metal Powder Self-Lubricating Bearings" by A. J. Langhammer, Amplex Div., Chrysler Corp., Detroit; and "Bearing Seals," by L. G. Krug, Chicago Rawhide Mfg. Co., Chicago.

In the evening at 7:00 pm, a dinner will be held in the Casino Room of the Congress Hotel. The next morning, May 7, at 9:30 am, an inspection trip will be conducted through the new completely integrated open hearth and electric furnace steel plant at Republic Steel Corp., South Chicago, Ill.

On Tuesday afternoon, the following papers will be presented: "Speed Stability for Continuous Mills" by F. E. Crever and T. M. Linville, General Electric Co., Schenectady; "A New Soaking Pit Design" by Norman Urquhart, Fort Pitt Bridge Co., Canonsburg, Pa.; "Modern Steel Providing Methods," by R. W. Graham, Carnegie-Illinois Steel Corp., Munhall, Pa.; "Bar Mill Housings and Equipment" by J. N. Imel, Jones & Laughlin Steel Corp., Pittsburgh.

Construction Steel...

New York

• • • **The estimated total** bookings of fabricated structural steel for bridge and building construction for the month of March 1946, according to reports received by the American Institute of Steel Construction amounted to 164,568 tons, an increase of 35 pct over the February total of 121,574 tons.

March shipments totaled 86,872 tons, an increase of 36,607 tons over the month of February, when production was curtailed due to the effects of the steel strike. The tonnage available for future fabrication at Mar. 31 has increased to 604,687 tons.

Following is the complete tabulation of bookings and shipments:

	Estimated total tonnage for the entire industry 1946	Estimated total tonnage for the entire industry avg. 1936/1940
CONTRACTS CLOSED		
January	225,037	107,578
February	121,574	96,280
March	164,568	124,558
Totals	511,179	328,416
SHIPMENTS		
January	89,252	92,578
February	50,265	88,626
March	86,872	115,031
Totals	226,389	296,235
Tonnage available for fabrication within the next four months..	604,687	313,635

• • • **Fabricated steel awards** this week included the following:

1400 Tons, Texas City, Tex., pipe racks, Carbide & Carbon Chemical Corp., to American Bridge Co., Pittsburgh.

1350 Tons, Ainsworth-Brighton, Iowa, Rock Island RR bridge, to American Bridge Co., Pittsburgh.

1325 Tons, Utica, N. Y., factory and office building, to Utica Steam Engine & Boiler Co.

1150 Tons, Ann Arbor, Mich., University of Michigan, general service building, to American Bridge Co., Detroit.

960 Tons, Galesburg, Ill., buildings, Butler Mfg. Co., to American Bridge Co., Pittsburgh.

640 Tons, Trenton, N. J., warehouse, to Bethlehem Steel Co., Bethlehem, Pa.

635 Tons, New Martinsville, W. Va., chlorine barges, to Dravo Corp., Neville Island, Pittsburgh.

625 Tons, Various Locations, beam and girder spans, Chicago, Rock Island & Pacific Ry. Co., to American Bridge Co., Pittsburgh.

545 Tons, Louisville, Ky., Belknap Hardware Mfg. Co., warehouses, to American Bridge Co., Pittsburgh.

450 Tons, New Alexandria, Pa., bridges, Latrobe Road Construction, Inc., to American Bridge Co., Pittsburgh.

375 Tons, Pittsburgh, addition to stack house No. 3, Lando Bros. Building Co., to American Bridge Co., Pittsburgh.

337 Tons, Cuba, spinning machine parts, U. S. Steel Export Co., to American Bridge Co., Pittsburgh.

350 Tons, Columbus, Ohio, engine house extension, Pennsylvania RR, to American Bridge Co., Pittsburgh.

300 Tons, Williamsport, Pa., manufacturing building, Lundy Construction Co., to American Bridge Co., Pittsburgh.

300 Tons, Atlanta, Ga., U. S. Envelope Co., factory building, to Southern Steel Works Co., Birmingham; Roberts Co., Atlanta, engineers.

250 Tons, Lorain, Ohio, kickback trestle, Baltimore & Ohio RR, to American Bridge Co., Pittsburgh.

210 Tons, Binghamton, N. Y., bridge RC-46-14, Serafine Construction Co., to American Bridge Co., Pittsburgh.

175 Tons, Sheboygan, Wis., bridge 2012, Chicago & North Western RR, to American Bridge Co., Pittsburgh.

160 Tons, Whiting, Ind., phenol treating plant tower, M. W. Kellogg Co., to American Bridge Co., Pittsburgh.

150 Tons, Rochester, N. Y., store building extension, John B. Pike & Sons, to American Bridge Co., Pittsburgh.

120 Tons, Hyde Park, N. Y., bridge TSO-45-2, John Arborio Indiana, to American Bridge Co., Pittsburgh.

100 Tons, Nashua-Portsmouth, N. H., two telephone exchanges to Lyons Iron Works, Manchester, N. H., through Davison Construction Co., Manchester, N. H.

• • • **Fabricated steel inquiries** this week included the following:

1200 Tons, Odair, Wash., trash racks, Grand Coulee Dam, bids to U. S. Bureau of Reclamation.

820 Tons, Yellowstone Div., Mont., bridges, Northern Pacific Ry.

400 Tons, Redding, Calif., cofferdam for Shasta Dam, bids to U. S. Bureau of Reclamation.

400 Tons, Placer County, Calif., American River bridge, Tahoe National Forest, Public Roads Administration, San Francisco; Fred D. Kyle, Los Angeles, general contractor.

361 Tons, San Diego County, Calif., two steel bridges across San Luis Rey River and Keys Canyon Creek, California Div. of Highways, Los Angeles; Spencer Webb, Los Angeles, general contractor.

225 Tons, Louise, Ariz., warehouse building, Davis Dam, bids to U. S. Bureau of Reclamation.

250 Tons, Jackson, Miss., manufacturing plant, Armstrong Cork Co.

• • • **Reinforcing bar** awards this week included the following:

750 Tons, Milwaukee, Miller Brewing Co., plant addition to W. H. Pipkorn Co., Milwaukee.

500 Tons, Binghamton, N. Y., General Aniline & Film Corp., to Concrete Steel Co.

360 Tons, Racine, Wis., Western Printing & Lithographing Co., to Worden-Allen Co., Milwaukee.

220 Tons, Lorain, Ohio, Baltimore & Ohio coal dock, to Carnegie-Illinois Steel Corp.

146 Tons, San Bernardino County, Calif., reinforced concrete bridges between Vineyard Ave. and Etiwanda, California Div. of Highways, through Matich Bros., to Trojan Steel, Inc.

• • • **Reinforcing bar** inquiries this week included the following:

4350 Tons, Brooklyn, N. Y., Marcy housing project.

3200 Tons, Philadelphia, Inquirer & Triangle Publications, building.

2500 Tons, Detroit, Fisher Body Div., General Motors Corp., stamping plant.

560 Tons, Wichita, Kans., Rounds & Porter milk plant.

468 Tons, Williamsport, Pa., levee units 1, 2, 3.

300 Tons, Bronx, N. Y., sewer work.

260 Tons, Racine, Wis., high school.

250 Tons, Dayton, Ohio, sewage disposal plant.

221 Tons, East Sidney, N. Y., Sidney Dam.

180 Tons, Washington, W. Va., E. I. du Pont de Nemours & Co., building.

181 Tons, Addison and Steuben Counties, N. C., flood control project.

150 Tons, Hamilton County, Ohio, St. Joseph College.

118 Tons, Cedar City, Iowa, bridge.

108 Tons, San Diego County, Calif., two steel bridges across San Luis Rey River and Keys Canyon Creek, California Div. of Highways, Los Angeles; Spencer Webb, Los Angeles, general contractor.

High Working Costs May Close Ore Mines

Marquette, Mich.

• • • **The high cost of mining** underground ore on the Marquette range when open pit ore is available elsewhere was placed before striking miners here recently as an important factor in the wage dispute which has kept the underground mines closed since Feb. 8.

Clarence B. Randall, vice-president of Inland Steel Co., asserted in a radio address that if his company met the 18½¢ per hr pay increase demanded by United Steel Workers of America (CIO) locals, his firm could no longer use underground ore and meet competition. Inland offered a 10¢ per hr increase Mar. 22, which it has paid to maintenance crews and non-striking production workers since.

Mr. Randall said that it takes from six to seven times as many men to mine a ton of ore at its Morris mine in Michigan as to mine open pit ore at Oliver Iron Mining Co.'s Hull-Rust mine at Hibbing, Minn., thus pyramiding the effect of wage increases on underground operators. Inland had on its docks at Indiana Harbor one million tons of ore on Apr. 1, sufficient to meet its requirements for capacity operation until Sept. 1, Mr. Randall declared. Thereafter, he said, the company could meet its requirements indefinitely from Minnesota open pit mines and from the Steep Rock mine in Canada, and would do so if it proved cheaper, he said.

Underlining cost problems on the Marquette, he stated that the cost of pumping water alone at the company's Morris mine was greater than that of mining a ton of ore at the Hull-Rust.

MACHINE TOOLS

. . . News and Market Activities

Tool Builders Cautious on Price Pattern

Cleveland

• • • **Caution is the keynote** as broad outlines of the machine tool industry's new price pattern begin to take shape, following OPA's authorization of a 20 pct price increase, effective Apr. 19.

Action thus far taken points to price increases averaging from 12 to 15 pct where they have been in creased at all. Prices of many machines, notably those in long supply in the government-owned machine tool surplus, and those on which the builders have been able to realize an operable profit, have not been changed. Thus, the industry is starting to dig in.

One producer, summing up his new price structure, said that increases thus far applied will mean an overall increase in revenue of 4 pct, based on total shipments including repair parts; on machine tools only, his increase will aggregate 2 2/3 pct; and on the machines themselves that were raised in price, 11 pct. Other builders have reported price increases averaging 12 and 13 pct, on those machines to which they have seen fit to apply a part of OPA's new yardstick.

Prices of some machine tools, particularly those developed during the war and produced largely at a loss since their entrance into the field, have been increased 20 pct. These machines, and some models which some of the builders have been dropping from their lines, may soon be expected to show themselves on the right side of the ledger, but competition, concomitant with excess capacity in many segments of the industry, will keep the profits from taking wings even without the earthbound aegis of OPA.

Price advances ranging from 10 pct to 20 pct on drilling, milling, planing, grinding, broaching and miscellaneous machine tools have been put into effect by builders in the Boston area. However, an upward revision of quotations here, as in other districts, is by no means general. More than a few builders are still in a quandary as to just what action they should take, while some have decided to take no action for 30 or 60 days, regardless of the moves of their competitors.

Few prospects, according to machine tool dealers, have voiced opposition to a price hike, but little actual business is being booked at the moment, while on the other hand, the government-owned surplus is moving fairly well.

Many sources in the industry felt that business was turning up in March, and that many customers would soon be on the books with postwar, cost-cutting problems. Now, with a very considerable segment of machine tool users hamstrung production-wise by the steel shortage in general and by the absolute scarcity of bar stock and small rounds in particular, some observers feel that the next 60 or 90 days will be a period of travail.

The government-owned machine tool surplus is omnipresent, and according to informed sources, becoming more and more of a factor. New inquiries are reported sparse, and while many customers are not always willing to admit their interest in WAA machine tool wares, bringing out the surplus list is often all that is required. Reports of WAA machines still on the original skids are multiplying in number, and with the attractive price differential, builders and dealers alike know the battle is on.

Signs of the times are evident in the WAA surplus disposal report for Mar. 16 through Mar. 31 on sales of the Chicago office, in which several big machine tool buyers appear. Caterpillar Tractor Co. purchased machinery costing $523,449 to lead individual buyers. Other big purchasers included Allis-Chalmers Mfg. Co., $441,376; Chrysler Corp., $437,210; International Harvester Co., $236,046.

Total sales through the Chicago office for the Mar. 16-Mar. 31 period were $4,742,120 compared to material and equipment assigned for sale having an acquisition cost of $24,136,756. The office to date has had property assigned for sale at an acquisition cost of $270,075,984.

In Detroit, the comparatively quiet rate of operations in tooling shops, as differentiated from the machine tool companies, is worthy of note. Customarily at this time of year the tooling shops are working in high gear, 45 to 56 hr or more per week, getting tools, jigs, dies, molds and fixtures ready for new automobile manufacturing to begin in the fall. However, elimination of the new model introductions next fall has reduced the average hours of work in the tool shops to no more than 45, and most shops are working straight 40-hr schedules. Backlogs are comparatively low, and deliveries, therefore, are obviously in the near turn.

Some uncertainty concerning the general business situation pervades the Cincinnati machine tool market, which is not unique in this regard. The recent meeting of the machine tool builders, it is reported, brought a fairly general conviction that the full extent of OPA's price relaxation is not likely to be acceptable to Washington. Sources in the trade report that bookings are fair, but for the most part, manufacturers are eating into backlogs at a high rate.

•

Cutting Tool Prices Up

Washington

• • • **Effective immediately,** OPA on Apr. 24 granted manufacturers of all cutting tools and all attachments and accessories for machinery and machine tools (as listed under RMPR 136) a price increase of 17.3 pct over Mar. 31, 1942 prices. Included are ground steel stock and manual tools for the cutting, forming and punching of metals. More than 200,000 items are covered by this action, OPA said. However, buffing and polishing wheels are not included.

Increase is necessary, OPA explained, to cover increases in the prices of steel and forgings and other materials and wage rates and will return to the industry its base period profits during the next 12 months. At the same time, OPA permitted resellers to increase their prices by the same percentage as their net invoiced costs are increased by this action.

TYPE "A" ASSEMBLY BIT

COMMON SCREWDRIVER

Here Are Results

computable in dollars and cents on the profit side of production . . . results obtainable only with CLUTCH HEAD Screws because they have exclusive features for safety and speed unmatched by any other screw on the market.

In the great Norge Plants, where the drive of screws runs into millions, safeguarding the beauty of an immaculate cabinet ranks in importance *as a cost factor* with speed of assembly.

With CLUTCH HEAD Screws, costly damage caused by driver slippage is eliminated:

1. Because the Center Pivot Column on the driver guides the bit into deep dead-center of the Clutch recess for automatically straight driving free from canting.
2. Because the driving engagement is all-square, eliminating the need for strenuous end pressure to combat "ride-out" as set up by tapered driving . . . one of the major causes of driver slippage.

The step-up in driving tempo logically results from the roomy easy-to-hit Clutch target, the positively centered entry, the sureness of the torque grip, and the effortless drive home. CLUTCH HEAD also contributes unmatched tool economy with the rugged Type "A" Bit that drives thousands more screws without interruption.

Note how simple it is to recondition this bit. It may be *repeatedly* restored to original efficiency by a 60-second application of the end surface to a grinding wheel. No "back-to-the-factory" shipment necessary. . . . No delay. No expense.

CLUTCH HEAD SCREWS

Norge too, in common with all users of CLUTCH HEAD, enjoys the benefit of simplified field service because this screw is basically designed for operation with the ordinary screwdriver or any flat blade reasonably accurate in width.

UNITED SCREW AND BOLT CORPORATION

CLEVELAND 2 CHICAGO 8 NEW YORK 7

NONFERROUS METALS

. . . News and Market Activities

Bill to Increase Prices Gets Support

Washington

• • • **Senate committee** approval of the so-called McFarland amendment to the CPA extension bill appears certain following strong support received by witnesses appearing for the lead, copper and zinc industries.

The amendment would shift a large proportion of subsidy payments for production of these metals into the ceiling prices, cut the proposed $100 million for this purpose in half, and make adjustments in the Premium Price Plan to correct any existing inequities.

More specifically, the amendment requires that subsidies shall be reduced by shifting 60 pct of the initial premium into the prices of the respective metals. In the case of lead where the ceiling has been held to 6.5¢ with the initial premium 2.75¢ per lb, the amendment would shift 1.65¢ into the ceiling price which would be established at 8.15¢ for the large portion of production which receives no subsidies.

The present ceiling of 6.5¢, according to statistics compiled by the Lead Industries Assn., is below that of any of the peacetime years 1923-1927, inclusive, when the price ranged from a low of 6.76¢ to a high of 9.02¢.

•

Copper Replaces Lead

London

• • • **The acute shortage** of lead has expanded the demand for copper for housing in Britain. The British government has taken steps to have copper specified for its housing programs, and training is being given in production of copper plumbing. According to the *London Economist* copper is to be specified for plumbing in the British Iron & Steel Federation house.

British sources state that the Ministry of Supply has taken no steps to safeguard deliveries of copper to the United Kingdom next year, and note five year contracts drawn up by others. Deliveries are said to have increased from twelve days on strip and sheet copper in early 1945 to as much as nine months on some items today. Tubes are said to be particularly short.

•

Nickel Production Drops

Ottawa

• • • **Production of nickel** in Canada in January amounted to 13,823,097 lb, compared with 15,276,195 lb in December and 23,770,268 lb in January, 1945. Exports of nickel in January was 11,526,800 lb, valued at $2,995,775.

New copper produced in January amounted to 32,021,065 lb, compared with 34,930,910 lb, in December and 44,381,428 lb, in January last year. Output of refined copper in the month totaled 28,532,786 lb, while exports of copper in ore, concentrates and matte amounted to 2,658,000 lb, valued at $186,060, and of copper bars, slabs, and billets to 24,842,200 lb, valued at $3,199,017.

•

Acts to Bring Out Lead

Washington

• • • **With the world-wide** demand at an all-time high in the face of an acute and growing shortage, heads of government agencies and leaders of industry met on Apr. 18 with Reconversion Director John W. Snyder and mapped a program to increase the nation's supply of lead. Measures agreed upon included a nationwide scrap and salvage drive, strict conservation and allocation to eliminate non-essential use of lead, an effort to step up imports, early settlement of strikes to increase current domestic output and exploration of new domestic and foreign supply. Attributing the world shortage chiefly to the lack of production in war-affected areas and universal wartime depletion, together with strikes in the United States, inadequate recovery of scrap lead and imports, Mr. Snyder said that American industry could use a record amount of 1,300,000 tons in 1946, but that not over 835,000 tons is in sight.

He asked the Department of State, the War Department, the Navy Department and the RFC to investigate all possible foreign sources. Recently, he said, 15,000 tons of available lead have been discovered in Japan and the Department of State has cabled Gen. Douglas MacArthur for information regarding the possible early shipment to the United States.

The Reconversion Director said that strikes in mines and refineries have already cost 50,000 tons of lead but that prospects of early settlement are good. The labor department was asked to review the manpower situation in the lead producing industry and to make plans to recruit workers if necessary. Declaring that American lead mines have been heavily drawn upon during the war, Mr. Snyder said that they may not be able to supply more than five years of future consumption. For this reason he asked the Bureau of Mines for intensification of lead prospecting and exploration of mineral resources with a view to assuring a supply during the high consumption years ahead.

•

Bronze Co. Sales Up

Cleveland

• • • **Cleveland Graphite Bronze Co.** has reported net sales of $5,885,444 in the first quarter of 1946 and net profit of $218,214 after all charges and provision for Federal taxes. The profit, which includes an excess profits carry-back of $95,000, is equal after preferred dividends to 58¢ a common share. In the first quarter last year sales were $15,572,319 and net profit was $399,354, or $1.14 a share.

President Ben F. Hopkins said that while sales in January and February were sharply reduced by the inability of strike-bound customers to receive shipments, March sales were by far the largest the company has had in any peacetime month.

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, del'd (Min. 10,000 lb)	15.00
Aluminum pig	14.00
Antimony, American, Laredo, Tex.	14.50
Beryllium copper, 3.75-4.25% Be; dollars per lb. contained Be	$14.75
Beryllium aluminum, 5% Be; dollars per lb. contained Be	$30.00
Cadmium, del'd	90.00
Cobalt, 97-99% (per lb)	$1.50 to $1.57
Copper, electro, Conn. valley	12.00
Copper, electro, New York	11.75
Copper, lake	12.00
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$ 2.25
Iridium, dollars per troy oz.	$90-$100
Lead, St. Louis	6.35
Lead, New York	6.50
Magnesium, 99.9 + %, carlots	20.50
Magnesium, 12-in. sticks, carlots	27.50
Mercury, dollars per 76-lb flask, f.o.b. New York	$103 to $105
Nickel, electro	35.00
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per oz.	$35.00
Silver, New York, cents per oz.	70.75
Tin, Straits, New York	52.00
Zinc, East St. Louis	8.35
Zinc, New York	8.65
Zirconium copper, 6 pct Zr, per lb contained Zr	6.00

Remelted Metals

(Cents per lb)

Aluminum, No. 12 Fdy. (No. 2)	10.00 to 10.50
Aluminum, deoxidizing No. 2, 3, 4	8.25 to 10.50
Brass Ingot	
85-5-5-5 (No. 115)	13.25
88-10-2 (No. 215)	16.75
80-10-10 (No. 305)	16.00
No. 1 Yellow (No. 405)	10.25

Copper, Copper Base Alloys

(Mill base, cents per lb)

	Extruded Shapes	Rods	Sheets
Copper	22.10	....	22.08
Copper, H.R.	....	18.60	....
Copper drawn	....	19.60	....
Low brass, 80%	....	21.43	20.81
High brass	....	....	21.48
Red brass, 85%	....	21.64	21.69
Naval brass	21.40	20.15	25.83
Brass, free cut	....	16.04	....
Commercial bronze, 90%	....	22.35	22.40
Commercial bronze, 95%	....	22.56	22.61
Manganese bronze	25.10	....	29.33
Phos. bronze, A, B, 5%	....	39.02	38.77
Muntz metal	21.15	19.90	24.08
Everdur, Herculoy, Olympic or equal	....	26.53	27.33
Nickel silver, 5%	....	30.80	28.62
Architect bronze	20.15	....	....

Aluminum

(Cents per lb, base, subject to extras for quantity, gage, size, temper and finish)

Tubing: 2 in. OD by 0.065 in. wall: 2S-½H, 40¢; 52S-O, 61¢; 24S-T, 67.5¢; base, 2000 to 4999 lb.

Plate: ¼ in. and heavier: 2S, 3S, 21.2¢; 52S, 24.2¢; 61S, 22.8¢; 24S, 24S-AL, 24.2¢; 75S, 75S-AL, 29.5¢; base, 30,000 lb and over.

Flat Sheet: 0.136 in. thickness: 2S, 3S, 22.7¢; 52S, 26.2¢; 61S, 24.7¢; 24S-O, 24S-OAL, 26.7¢; 75S-O, 75S-OAL, 31.7¢; base, 30,000 lb and over.

Extruded Shapes: factor determined by dividing the perimeter of the shape by its weight per foot. For factor 1 through 4, 2S, 3S, 25.5¢; 17S, 31¢; 24S, 34¢; 53S, 28¢; 61S, 28.5¢; 63S, 26.5¢; 75S, 39¢; base 2000 to 5000 lb.

Wire, Rod and Bar—screw machine stock, rounds, 11S-T3, 17S-T, ¼ in., 28.5¢; ½ in., 26¢; 1 in., 24.5¢; 2 in., 23¢; hexagons, ¼ in., 34.5¢; ½ in., 28.5¢; 1 in., 2 in., 25.5¢; base 5000 lb. *Rod:* 2S, 3S, 1¼ to 2½ in. diam., rolled, 23.5¢; cold-finished, 24¢; base 30,000 lb. *Round Wire:* drawn, coiled, B & S gage 17-18: 2S, 3S, 33.5¢; 56S, 37.5¢; B & S gage 23: 2S, 3S, 41.5¢; 56S, 44.5¢; 10,000 lb base; B & S gage 00-1: 2S, 3S, 21¢; 56S, 29¢; B & S 15-16: 2S, 3S, 32.5¢; 56S, 36.5¢; base 30,000 lb.

Magnesium

Sheet, rod, tubes, bars, extruded shapes subject to individual quotations. Metal turnings: 100 lb. or more, 46c. a lb.; 25 to 90 lb., 56c.; less than 25 lb., 66c.

NONFERROUS SCRAP METAL QUOTATIONS

†(OPA basic maximum prices, cents per lb., f.o.b. point of shipment, subject to quality, quantity and special preparation premiums—other prices are current quotations)

Copper, Copper Base Alloys

OPA Group 1†

No. 1 wire, No. 1 heavy copper	9.75
No. 1 tinned copper wire, No. 1 tinned heavy copper	9.75
No. 2 wire, mixed heavy copper	8.75
Copper tuyeres	8.75
Light copper	7.75
Copper borings	9.75
No. 2 copper borings	8.75
Lead covered copper wire, cable	6.00*
Lead covered telephone, power cable	6.04
Insulated copper	8.00*

OPA Group 2†

Bell metal	15.50
High grade bronze gears	13.25
High grade bronze solids	11.50*
Low lead bronze borings	11.50*
Babbitt lined brass bushings	13.00
High lead bronze solids	10.00*
High lead bronze borings	10.00*
Red trolley wheels	10.75
Tinny (phosphor bronze) borings	10.50
Tinny (phosphor bronze) solids	10.50
Copper-nickel solids and borings	9.25
Bronze paper mill wire cloth	9.50
Aluminum bronze solids	9.00
Soft red brass (No. 1 composition)	9.00
Soft red brass borings (No. 1)	9.00
Gilding metal turnings	8.50
Contaminated gilded metal solids	8.00
Unlined standard red car boxes	8.25
Lined standard red car boxes	7.75
Cocks and faucets	7.75
Mixed brass screens	7.75
Red brass breakage	7.50
Old nickel silver solids, borings	6.25
Copper lead solids, borings	6.25
Yellow brass castings	6.00
Automobile radiators	7.25
Zincy bronze borings	7.00
Zincy bronze solids	8.00

OPA Group 3

Fired rifle shells	8.00
Brass pipe	7.25
Old rolled brass	6.75
Admiralty condenser tubes	7.25
Muntz metal condenser tubes	6.75
Plated brass sheet, pipe reflectors	6.25
Manganese bronze solids	5.50[1]
Manganese bronze solids	4.50[2]
Manganese bronze borings	4.00[1]

OPA Group 4

Refinery brass	4.50*

*Price varies with analysis, [1] Lead content 0.00 to 0.40 pct. [2] Lead content 0.41 to 1.00 pct.

Brass Mill Scrap†

Briquetted cartridge brass turnings	8.625
Cartridge brass turnings, loose	7.875
Loose yellow brass trimmings	7.875

Aluminum*

Plant scrap, segregated

2S solids	8.50 to 9.00
Dural alloys, solids 14, 17, 18, 24S, 25S	5.00 to 5.50
turnings, dry basis	3.50 to 4.00
Low copper alloys 51, 52, 61, 63S solids	7.00 to 8.00
turnings, dry basis	5.00 to 6.50

Plant scrap, mixed

Solids	5.25
Turnings, dry basis	4.00

Obsolete scrap

Pure cable	8.00
Old sheet and utensils	7.50
Old castings and forgings	6.00
Pistons, free of struts	5.00
Pistons, with struts	4.50
Old alloy sheet	3.00 to 4.00

Magnesium*

Segregated plant scrap

Pure solids and all other solids, exempt	
Borings and turnings	1.50

Mixed, contaminated plant scrap

Grade 1 solids	3.00
Grade 1 borings and turnings	2.00
Grade 2 solids	2.00
Grade 2 borings and turnings	1.00

*Nominal.

Zinc

New zinc clippings, trimmings	6.50
Engravers, lithographers plates	6.50
Old zinc scrap	4.75
Unsweated zinc dross	5.00
Die cast slab	4.50
New die cast scrap	4.45
Radiator grilles, old and new	3.50
Old die cast scrap	3.00

Lead

Deduct 0.55c. a lb. from refined metal basing point prices or soft and hard lead including cable, for f.o.b. point of shipment price.

Nickel

Ni content 98+%, Cu under ½%, 22¢ per lb.; 90 to 98% Ni, 23¢ per lb. contained Ni.

ELECTROPLATING ANODES AND CHEMICALS

Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Copper, frt. allowed	
Cast, oval, 15 in. or longer	25½
Electrodeposited	18⅞
Rolled, oval, straight	19⅝
Curved	20⅝
Brass, 80-20, frt. allowed	
Cast, oval, 15 in. or longer	23⅝
Zinc, cast, 99.99, 15 in. or longer	16¼
Nickel, 99 pct plus, frt. allowed	
Cast	47
Rolled, depolarized	48
Silver, 999 fine	
Rolled, 100 oz. lots, per oz.	80¾

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 1-5 bbls	34.00
Copper sulphate, 99.5, crystals, bbls	7.75
Nickel salts, single, 425 lb bbls, frt allowed	13.50
Silver Cyanide, 100 oz lots, per oz	0.655
Sodium cyanide, 96 pct, domestic, 100 lb drums	15.00
Zinc cyanide, 100 lb drums	33.00
Zinc sulphate, 89 pct, crystals, bbls, frt allowed	6.35

SCRAP

Market Holds Firm Despite Coal Strike

New York

• • • With the coal strike going into its fourth week, the scrap industry has not yet begun to feel its effect except for an appreciably tighter position in cast scrap which, before the beginning of the strike, did not seem possible. There is, it is true, some feeling of easiness in steel scrap in some market districts, but this has not yet reached the point where there is any possibility of a drop below ceilings within the next few weeks.

Those blast furnaces that are still operating are using a larger proportion of turnings to compensate for the strike in ore mining areas. Hence, there is a greater demand for the available supply of turnings which have not yet begun to come out in quantity on reconversion products.

This position, however, may be modified appreciably within the next few weeks. Eugene G. Grace of Bethlehem, at the quarterly board meeting last week, announced a current production rate of 98 pct this month, but says that company production has begun to drop and will be under 50 pct by mid-May unless the coal strike ends promptly. Since Bethlehem is the largest single factor in the scrap consuming field, it is reasonable to assume that by the time specified the market may reflect the loss of this and many other steel producers.

The first significant evidence of the way the coal strike is affecting the industry is reported from Detroit where it is said that mills are advising their customers that they must have the resultant scrap back in order to keep their operations going. Obviously, if this trend grows, there must be an appreciable amount of long distance cross-hauling.

The report of the Bureau of Mines for December scrap indicates how consumers' stocks of purchased scrap have steadily diminished from over 2.5 million tons in August to 2.25 million tons in December. Likewise, pig iron stocks have dropped from 1.36 to 1.06 million tons. Meanwhile, consumption of purchased scrap and home scrap remain at the same rate for those two months; purchased, 1.6; home, 1.9 million tons. Pig iron consumption, likewise, has remained fairly constant at 3.6 million tons.

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PITTSBURGH—The low operating rate in Pittsburgh is the only thing that keeps scrap from being an extremely scarce item. With the major consumer operating at less than 25 pct, the supply is fairly consistent with demand. The coal strike is making it possible for some mills to lay down scrap, and there is some production scrap moving in from the auto producers, but the bulk of this is going to plants closer to Detroit. However, continuance of the coal strike will merely cause a slump in incoming production scrap at a later date, thus prolonging the critical scrap situation.

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CHICAGO—Attempts of most steelmakers in this area to maintain a high rate of operations with a minimum of hot metal, because of the coal strike, is resulting in a rapid depletion of scrap reserves built up during the steel strike. Resumption of automotive foundry operations on a larger scale also has added a new demand factor. Production scrap still is not coming out in quantity, although larger amounts are generated each week. Interest in remote scrap continues high, and yard operations are seasonally higher.

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PHILADELPHIA—Steel scrap is relatively easy in this area but cast and turnings are very tight now. Mills are reported to be still taking deliveries although some mills are watching developments in the coal strike closely and are reported to be "on a 24 hr basis." Considerable opposition has developed on the part of dealers to the statement of the industry advisory committee of OPA which went on record against higher scrap ceilings. Yards are now required to meet the 18½¢ per hr increase and claim there is no profit cushion to permit the added wage cost.

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DETROIT—Lists were being bid this week, with indications that offerings were not greatly different in quantity than in the immediate past. As before, awards generally are being pro-rated. However, one new factor is noted in the market here, in that mills are advising outlets for steel that they must have the resultant scrap back in order to keep their operations going—a situation which, as in the past, is making for cross-hauling and adding confusion to the picture. Recent working contract changes which award 18¢ pay increases to yard help are resulting in a curtailment of overtime wherever possible.

BUFFALO—Competition for scrap in the local area is keener than ever, with leading processors reporting yard stocks decreasing steadily as shipments to consumers keep gaining over receipts. Easing in demand at Pittsburgh has had no noticeable effect on supplies, although it is conceded that some stuff in borderline territory eventually may gravitate to Buffalo. Sales resistance at prevailing prices is on the rise again among sources of supply, apparently based on the growing belief that sooner or later the OPA will be forced to jack up ceilings on scrap. Consumption has been stepped up again in openhearths and foundries by another reduction in pig iron production.

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BOSTON—Everybody is scratching this territory for material with shipments running at a new 1946 low level. A 125 ton lot of mixed scrap at slightly better than $13.60 a ton and an equal tonnage of deck-house and other light cut material at $12.07 a ton are the largest recently reported open sales. Yards maintain they can sell any kind of scrap, while buyers say price is no object.

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NEW YORK—The unabated heavy mill demand for all grades of scrap, in spite of the coal strike, continues to hold the market in the same tight situation that has existed for the past several months. Cast grades are particularly short in supply, and seem to be getting worse. With large blast furnaces' output being gradually lowered due to the coal strike, the lack of production of pig iron is causing a further tightness in scrap supplies.

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CLEVELAND—Scrap market conditions here continue unchanged. Demand continues to exceed supply by a wide margin, and consumers who have shut down furnaces are stockpiling that portion of their shipments not going to furnaces still in operation. In light of the present scrap supply situation, even a complete shutdown of furnaces would provide only a temporary respite with resumption of operations.

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BIRMINGHAM—Despite reduced steel mill operations occasioned by the coal strike, demand for material shows no signs of slackening here. On the supply side, there is little movement of either agricultural or peddler scrap. Particularly scarce are the better grades of steel for openhearth use.

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CINCINNATI—Possibility of a decline in steelmaking and foundry melts, because of labor troubles in the coal areas has given no relief to the district iron and steel scrap market. Users are in the market for any good material that is available, and brokers indicate that acceptance of shipments continues. Some modest improvement in the production of scrap has been reported, but this has been insufficient to take care of the avid demand for scrap. Prices continue at the ceiling.

Going prices as obtained in the trade by IRON AGE editors, based on representative tonnages. Where asterisks are used on quotations below, this indicates a ceiling price to which must be added brokerage fee and adjusted freight.

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	$20.00*
RR. hvy. melting	21.00*
No. 2 hvy. melting	20.00*
RR. scrap rails	21.50*
Rails 3 ft. and under	23.50*
No. 1 comp'd sheets	20.00*
Hand bdld. new shts.	20.00*
Hvy. axle turn.	19.50*
Hvy. steel forge turn.	19.50*
Mach. shop turn.	15.00*
Short shov. turn.	17.00*
Mixed bor. and turn.	15.00*
Cast iron borings	16.00*
Hvy. break cast.	16.50*
No. 1 cupola	20.00*
RR. knuck. and coup.	24.50*
RR. coil springs	24.50*
Rail leaf springs	24.50*
Rolled steel wheels	24.50*
Low phos. bll. crops	25.00*
Low phos.	22.50*
RR. malleable	22.00*

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$18.75*
No. 2 hvy. melting	18.75*
No. 1 bundles	18.75*
No. 2 dealers' bndls.	18.75*
Bundled mach. shop turn.	18.75*
Galv. bundles	16.75*
Mach. shop turn.	13.75*
Short shovels, turn.	15.75*
Cast iron borings	14.75*
Mix. borings & turn.	13.75*
Low phos. hvy. forge	23.75*
Low phos. plates	21.25*
No. 1 RR. hvy. melt.	19.75*
Reroll rails	22.25*
Miscellaneous rails	20.25*
Angles & splice bars	22.25*
Locomotive tires, cut	24.25*
Cut bolsters & side frames	22.25*
Standard stl. car axles	25.75*
No. 3 steel wheels	23.25*
Couplers & knuckles	23.25*
Agricul. malleable	22.00*
RR. malleable	22.00*
No. 1 mach. cast	20.00*
Rails 3 ft. and under	22.25*
No. 1 agricul. cast	20.00*
Hvy. breakable cast.	16.50*
RR. grate bars	15.25*
Cast iron brake shoes	15.25*
Stove plate	19.00*
Clean auto cast	20.00*
Cast iron carwheels	20.00*

CINCINNATI

Per gross ton delivered to consumer:

No. 1 hvy. melting	$19.50*
No. 2 hvy. melting	19.50*
No. 1 bundles	19.50*
No. 2 bundles	19.50*
Mach. shop turn.	$10.50 to 11.00
Shoveling turn.	12.50 to 13.00
Cast iron borings	11.50 to 12.00
Mixed bor. & turn.	11.50 to 12.00
Low phos. plate	22.00*
No. 1 cupola cast.	20.00*
Hvy. breakable cast.	16.50*
Stove plate	19.00*
Scrap rails	21.00*

BOSTON

Dealers' buying prices per gross ton, f.o.b. cars

No. 1 hvy. melting	$15.05*
No. 2 hvy. melting	15.05*
No. 1 and 2 bundles	15.05*
Busheling	15.05*
Turnings, shovelings	12.05*
Machine shop turn.	10.05*
Mixed bor. & turn.	10.05*
Cl'n cast, chem. bor.	$13.06 to 14.15*

Truck delivery to foundry

Machinery cast.	21.00 to 23.51*
Breakable cast	21.57 to 21.87*
Stove plate	20.00 to 23.51*

DETROIT

Per gross ton, brokers' buying prices:

No. 1 hvy. melting	$17.32*
No. 2 hvy. melting	17.32*
No. 1 bundles	17.32*
New busheling	17.32*
Flashings	17.32*
Mach. shop turn.	12.32*
Short shov. turn.	14.32*
Cast iron borings	13.32*
Mixed bor. & turn.	12.32*
Low phos. plate	19.82*
No. 1 cupola cast.	20.00*
Charging box cast.	19.00*
Hvy. breakable cast.	16.50*
Stove plate	19.00*
Automotive cast	20.00*

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	$18.75*
No. 2 hvy. melting	18.75*
No. 2 bundles	18.75*
Mach. shop turn.	13.75*
Shoveling turn.	15.75*
Cast iron borings	14.75*
Mixed bor. & turn.	13.75*
No. 1 cupola cast	20.00*
Hvy. breakable cast	16.50*
Cast, charging box	19.00*
Hvy. axle forge turn.	18.25*
Low phos. plate	21.25*
Low phos. punchings	21.25*
Billet crops	21.25*
RR. steel wheels	23.25*
RR. coil springs	23.25*
RR. malleable	22.00*

ST. LOUIS

Per gross ton delivered to consumer:

Heavy melting	$17.50*
Bundled sheets	17.50*
Mach. shop turn.	13.50*
Locomotive tires, uncut.	$18.50 to 19.00
Misc. std. sec. rails	19.00*
Rerolling rails	21.00*
Steel angle bars	21.00*
Rails 3 ft. and under	21.50*
RR. springs	22.00*
Steel car axles	24.50*
Stove plate	19.00*
Grate bars	15.25*
Brake shoes	15.25*
RR. malleable	22.00*
Cast iron carwheels	20.00*
No. 1 mach'ery cast	20.00*
Breakable cast	16.50*

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	$17.00*
No. 2 hvy. melting	17.00*
No. 2 bundles	17.00*
No. 1 busheling	17.00*
Long turnings	12.00*
Shoveling turnings	14.00*
Cast iron borings	13.00*
Bar crops and plate	$18.50 to 19.50*
Structural and plate	18.50 to 19.50*
No. 1 cast	20.00*
Stove plate	19.00*
Steel axles	18.50*
Scrap rails	18.50
Rerolling rails	20.50*
Angles & splice bars	20.50 to 21.00
Rails 3 ft. & under	21.00*
Cast iron carwheels	17.50 to 18.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	$20.00*
No. 2 hvy. melting	20.00*
Low phos. plate	22.50*
No. 1 busheling	20.00*
Hydraulic bundles	20.00*
Mach. shop turn.	15.00*
Short shovel. turn.	17.00*
Cast iron borings	16.00*

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$15.33*
No. 2 hvy. melting	15.33*
Comp. black bundles	15.33*
Comp. galv. bundles	13.33*
Mach. shop turn.	10.33*
Mixed bor. & turn.	10.33*
Shoveling turn.	12.33*
No. 1 cupola cast	20.00*
Hvy. breakable cast	16.50*
Charging box cast	19.00*
Store plate	19.00*
Clean auto cast	20.00*
Unstrip. motor blks.	17.50*
Cl'n chem. cast bor.	14.33*

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$19.25*
No. 1 bundles	19.25*
No. 2 bundles	19.25*
No. 2 hvy. melting	19.25*
Mach. shop turn.	14.25*
Shoveling turn.	16.25*
Cast iron borings	14.25*
Cast iron borings	15.25*
Mixed bor. & turn.	14.25*
Stove plate	19.00*
Low phos. plate	21.75*
Scrap rails	20.75*
Rails 3 ft. & under	22.75*
RR. steel wheels	23.75*
Cast iron car wheels	20.00*
RR. coil & leaf spgs.	23.75*
RR. knuckles & coup.	23.75*
RR. malleable	22.00*
No. 1 busheling	19.25*

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	$19.50*
No. 2 hvy. melting	19.50*
Compressed sheet stl.	19.50*
Drop forge flashings	19.00
No. 2 bundles	19.50*
Mach. shop turn.	14.50*
Short shovel.	16.50*
No. 1 busheling	19.50*
Steel axle turn.	19.00*
Low phos. billet and bloom crops	24.50*
Cast iron borings	15.50*
Mixed bor. & turn.	14.50*
No. 2 busheling	17.00*
No. 1 machine cast	20.00*
Railroad cast	20.00*
Railroad grate bars	15.25*
Stove plate	19.00*
RR. hvy. melting	20.50*
Rails 3 ft. & under	23.00*
Rails 18 in. & under	24.25*
Rails for rerolling	23.00*
Railroad malleable	22.00*
Elec. furnace punch	22.00*

SAN FRANCISCO

Per gross ton delivered to consumer:

RR. hvy. melting	$15.00 to 15.75
No. 1 hvy. melting	15.00 to 15.75
No. 2 hvy. melting	14.00 to 14.75
No. 2 bales	13.00 to 13.75
No. 3 bales	7.50 to 8.25
Mach. shop turn.	6.50 to 7.25
Elec. furn. 1 ft. und.	15.50 to 17.00
No. 1 cupola cast	19.00 to 21.00

LOS ANGELES

Per gross ton delivered to consumer:

No. 1 hvy. melting	$14.50 to $15.25
No. 2 hvy. melting	13.50 to 14.25
No. 1 bales	13.50 to 14.25
No. 2 bales	12.50 to 13.25
No. 3 bales	8.00 to 9.00
Mach. shop turn.	6.00
No. 1 cupola cast	19.00 to 21.00

SEATTLE

Per gross ton delivered to consumer:

RR. hvy. melting	$12.50
No. 1 & No. 2 hvy. melting	12.50
Elec. furn. 1 ft. und.	$14.00 to 15.00
No. 1 cupola cast	20.00*

HAMILTON, ONT.

Per gross ton delivered to consumer:

Heavy melting	$17.50*
No. 1 bundles	17.50*
No. 2 bundles	17.00*
Mixed steel scrap	15.50*
Rails, remelting	18.50*
Rails, rerolling	21.50*
Bushelings	13.00*
Mixed borings & turnings	12.50*
Electric furnace bundles	20.50*
Manganese steel scrap	20.00*
No. 1 cast	19.00*
Stove plate	17.50*
Car wheels, cast	19.50*
Malleable iron	16.00*

Comparison of Prices . .

[Advances over past week in Heavy Type; declines in *Italics*. Prices are f.o.b. major basing points. The various basing points for finished and semifinished steel are listed in the detailed price tables.]

Flat-Rolled Steel (cents per pound)	Apr. 30, 1946	Apr. 23, 1946	Mar. 26, 1946	May 1, 1945
Hot-rolled sheets	2.425	2.425	2.425	2.20
Cold-rolled sheets	3.275	3.275	3.275	3.05
Galvanized sheets (24 ga.)	4.05	4.05	4.05	3.65
Hot-rolled strip				
6 in. and under	2.45	2.45	2.45	2.10
Over 6 in.	2.35	2.35	2.35	2.10
Cold-rolled strip	3.05	3.05	3.05	2.80
Plates	2.50	2.50	2.50	2.20
Plates, wrought iron	4.112	4.112	4.112	3.80
Stain's c-r strip (No. 302)	28.00	28.00	28.00	28.00
Tin and Terneplate: (dollars per base box)				
Tinplate, standard cokes	$5.25	$5.25	$5.25	$5.00
Tinplate, electro (0.50 lb)	4.75	4.75	4.75	4.50
Special coated mfg. ternes	4.55	4.55	4.55	4.30
Bars and Shapes: (cents per pound)				
Merchant bars	2.50	2.50	2.50	2.15
Cold-finished bars	3.10	3.10	3.10	2.65
Alloy bars	2.808	2.808	2.808	2.70
Structural shapes	2.35	2.35	2.35	2.10
Stainless bars (No. 302)	24.00	24.00	24.00	24.00
Wrought iron bars	4.76	4.76	4.76	4.40
Wire and Wire Products: (cents per pound)				
Bright wire	3.05	3.05	3.05	2.60
Wire nails	3.25	3.25	3.25	2.80
Rails: (dollars per net ton)				
Heavy rails	$43.39	$43.39	$43.39	$43.00
Light rails	49.18	49.18	49.18	43.00
Semifinished Steel: (dollars per gross ton)				
Rerolling billets	$39.00	$39.00	$39.00	$34.00
Sheet bars	38.00	38.00	38.00	34.00
Slabs, rerolling	39.00	39.00	39.00	34.00
Forging billets	47.00	47.00	47.00	40.00
Alloy blooms, billets, slabs	56.16	56.16	56.16	54.00
Wire Rods and Skelp: (cents per pound)				
Wire rods	2.30	2.30	2.30	2.00
Skelp	2.05	2.05	2.05	1.90

Pig Iron: (per gross ton)	Apr. 30, 1946	Apr. 23, 1946	Mar. 26, 1946	May 1, 1945
No. 2 foundry, Phila.	$28.34	$28.34	$28.34	$26.84
No. 2, Valley furnace	26.50	26.50	26.50	25.00
No. 2, Southern, Cin'ti	26.94	26.94	26.94	25.44
No. 2, Birmingham	22.88	22.88	22.88	21.38
No. 2 foundry, Chicago†	26.50	26.50	26.50	25.00
Basic, del'd eastern Pa.	27.84	27.84	27.84	26.34
Basic, Valley furnace	26.00	26.00	26.00	24.50
Malleable, Chicago†	26.50	26.50	26.50	25.00
Malleable, Valley	26.50	26.50	26.50	25.00
L. S. charcoal, Chicago	42.34	42.34	42.34	42.34
Ferromanganese‡	135.00	135.00	135.00	135.00

† The switching charge for delivery to foundries in the Chicago district is 60¢ per ton.
‡ For carlots at seaboard.

Scrap: (per gross ton)				
Heavy melt'g steel, P'gh.	$20.00	$20.00	$20.00	$20.00
Heavy melt'g steel, Phila.	18.75	18.75	18.75	18.75
Heavy melt'g steel, Ch'go	18.75	18.75	18.75	18.75
No. 1 hy. comp. sheet, Det.	17.32	17.32	17.32	17.32
Low phos. plate, Youngs'n	22.50	22.50	22.50	22.50
No. 1 cast, Pittsburgh	20.00	20.00	20.00	20.00
No. 1 cast, Philadelphia	20.00	20.00	20.00	20.00
No. 1 cast, Chicago	20.00	20.00	20.00	20.00
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$7.50	$7.50	$7.50	$7.00
Foundry coke, prompt	9.00	9.00	9.00	8.25
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro., Conn.	12.00	12.00	12.00	12.00
Copper, Lake	12.00	12.00	12.00	12.00
Tin, Straits, New York	52.00	52.00	52.00	52.00
Zinc, East St. Louis	8.25	8.25	8.25	8.25
Lead, St. Louis	6.35	6.35	6.35	6.35
Aluminum, virgin, del'd.	15.00	15.00	15.00	15.00
Nickel, electrolytic	35.00	35.00	35.00	35.00
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	14.50	14.50	14.50	14.50

Composite Prices . .

[Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942 and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite prices for the current quarter are an estimate based on finished steel shipments for the previous quarter. These figures will be revised when the actual data of shipments for this quarter are compiled.]

	FINISHED STEEL	PIG IRON	SCRAP STEEL
April 30, 1946	2.69516¢ per lb.	$26.12 per gross ton	$19.17 per gross ton
One week ago	2.69516¢ per lb.	$26.12 per gross ton	$19.17 per gross ton
One month ago	2.69516¢ per lb.	$26.12 per gross ton	$19.17 per gross ton
One year ago	2.42471¢ per lb.	$24.61 per gross ton	$19.17 per gross ton

	HIGH	LOW	HIGH	LOW	HIGH	LOW
1946	2.69516¢ Feb. 19	2.44104¢ Jan. 1	$26.12 Mar. 19	$25.37 Jan. 1	$19.17	$19.17
1945	2.44104¢ Oct. 2	2.38444¢ Jan. 2	25.37 Oct. 23	23.61 Jan. 2	$19.17 Jan. 2	$18.92 May 22
1944	2.30837¢ Sept. 5	2.21189¢ Oct. 5	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.29176¢	2.29176¢	23.61	23.61	$19.17	$19.17
1942	2.28249¢	2.28249¢	23.61	23.61	19.17	19.17
1941	2.43078¢	2.43078¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1935	2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
1934	2.15367¢ Apr. 24	1.95757¢ Jan. 2	17.90 May 1	16.90 Jan. 27	13.00 Mar. 13	9.50 Sept. 25
1933	1.95578¢ Oct. 3	1.75836¢ May 2	16.90 Dec. 5	13.56 Jan. 3	12.25 Aug. 8	6.75 Jan. 3
1932	1.89196¢ July 5	1.83901¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1931	1.99626¢ Jan. 13	1.86586¢ Dec. 29	15.90 Jan. 6	14.79 Dec. 15	11.33 Jan. 6	8.50 Dec. 29
1930	2.25488¢ Jan. 7	1.97319¢ Dec. 9	18.21 Jan. 7	15.90 Dec. 16	15.00 Feb. 18	11.25 Dec. 9
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 3

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 78 pct of the United States output. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

J&L STEEL

One of the two wheels above was in use for four months on a charging machine where it was daily subjected to repeated loadings of 300,000 pounds. Previously, regular carbon steel wheels would mushroom and have to be taken out of service in two weeks, thus presenting an expensive maintenance problem involving three men to make the replacement. A heat treated wheel of Jalloy steel was substituted and after four months' service removed for inspection. It is the wheel on the right. No appreciable wear can be seen when compared to the wheel beside it that was never in service. If you have an application that requires resistance to abrasion, fatigue and high impact strength write to us about heat treated Jalloy.

JONES & LAUGHLIN STEEL CORPORATION

PITTSBURGH 30, PENNSYLVANIA

Iron and Steel Prices...

Steel prices shown here are f.o.b. basing points, in cents per pound or dollars per gross ton. Extras apply. Delivered prices do not reflect 3 pct tax on freight. (1) Mill run sheet, 10¢ per 100 lb under base; primes, 25¢ above base. (2) Unassorted commercial coating. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) applies to certain width and length limitations. (6) For merchant trade. (7) For straight length material only from producer to consumer. Discount of 25¢ per 100 lb to fabricators. (8) Also shafting. For quantities of 20,000 lb to 39,999 lb. (9) Carload lot in manufacturing trade. (10) Prices do not apply if rail and water is not used. (11) Boxed. (12) This base price for annealed, bright finish wires, commercial spring wire. (13) Produced to dimensional tolerances in AISI Manual Sect. 6. (14) Billets only. (15) 9/32 in. to 47/64 in., 0.15¢ per lb higher.

Basing Points	Pitts-burgh	Chicago	Gary	Cleve-land	Birm-ingham	Buffalo	Youngs-town	Spar-rows Point	Granite City	Middle-town, Ohio	Gulf Ports, Cars	Pacific Ports, Cars[10]	DELIVERED TO Detroit	New York	Phila-delphia
INGOTS															
Carbon, rerolling	($33.00 f. o. b. mill)														
Carbon, forging	$38	$38	$38	$38	$38	$38	$38								
Alloy	$46.80	$46.80				$46.80	(Bethlehem, Massillon, Canton, Coatesville=$46.80)								
BILLETS, BLOOMS, SLABS															
Carbon, rerolling	$39	$39	$39	$39	$39	(Provo=$50.20, Duluth=$41[14]) $39	$39	$39				$51[14]	$41		
Carbon, forging billets	$47	$47	$47	$47	$47	(Provo=$58.20, Duluth=$49[14]) $47	$47					$59[14]	$49		
Alloy	$56.16	$56.16				$56.16	(Bethlehem, Massillon, Canton=$56.16)						$61		
SHEET BARS	$38	$38		$38		$38	$38	$38	(Canton=$38)						
PIPE SKELP	2.05¢	2.05¢					2.05¢	2.05¢	(Coatesville=2.05¢)						
WIRE RODS[15]															
No. 5 to 9/32 in.	2.30¢	2.30¢		2.30¢	2.30¢	(Worcester=2.40¢)					2.55¢	2.80¢			
SHEETS															
Hot-rolled	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.525¢	2.425¢		2.975¢	2.525¢	2.665¢	2.595¢
Cold-rolled[1]	3.275¢	3.275¢	3.275¢	3.275¢		3.275¢	3.275¢		3.375¢	3.275¢		3.925¢	3.375¢	3.615¢	3.595¢
Galvanized (24 gage)	4.05¢	4.05¢	4.05¢		4.05¢	4.05¢	4.05¢	4.05¢	4.15¢	4.05¢		4.60¢		4.29¢	4.22¢
Enameling (20 gage)	3.80¢	3.80¢	3.80¢	3.80¢			3.80¢		3.90¢	3.80¢		4.45¢	3.90¢	4.16¢	4.12¢
Long ternes[2]	4.05¢	4.05¢	4.05¢									4.80¢		4.41¢	4.37¢
STRIP															
Hot-rolled[3] 6 in. and under	2.45¢	2.45¢	2.45¢	2.45¢	2.45¢		2.45¢			2.45¢		3.10¢	2.55¢	2.81¢	2.77¢
Hot-rolled[3] over 6 in.	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢		2.35¢			2.35¢		3.00¢	2.45¢	2.71¢	2.67¢
Cold-rolled[4]	3.05¢	3.15¢		3.05¢			3.05¢	(Worcester=3.25¢)					3.15¢	3.41¢	3.37¢
Cooperage stock	2.55¢	2.55¢			2.55¢		2.55¢							2.91¢	
Commodity cold-rolled	3.20¢	3.30¢		3.20¢			3.20¢	(Worcester=3.60¢)					3.30¢	3.56¢	
TINPLATE															
Standard cokes, base box	$5.25	$5.25	$5.25		$5.35			$5.35	$5.35					$5.60[11]	$5.53[11]
Electro, box 0.25 lb	$4.60	$4.60	$4.60					$4.70							
Electro, box 0.50 lb	$4.75	$4.75	$4.75					$4.85	$4.85						
Electro, box 0.75 lb	$4.90		$4.90					$5.00	$5.00						
BLACKPLATE															
29 gage[5]	3.30¢	3.30¢	3.30¢					3.40¢	3.40¢						3.57¢
TERNES, MFG.															
Special coated, base box	$4.55	$4.55	$4.55					$4.65	$4.65						
BARS															
Carbon steel	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	(Duluth=2.60¢) (Provo, Utah=3.20¢)			2.85¢	3.15¢	2.60¢	2.84¢	2.82¢
Rail steel[6]	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢					2.85¢	3.15¢			
Reinforcing (billet)[7]	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢			2.70¢	2.75¢	2.45¢	2.59¢	2.67¢
Reinforcing (rail)[7]	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢				2.70¢	2.75¢	2.45¢		2.57¢
Cold-finished[8]	3.10¢	3.10¢	3.10¢	3.10¢		3.10¢		(Detroit=3.15¢)			(Toledo=3.25¢)			3.44¢	3.42¢
Alloy, hot-rolled	2.808¢	2.808¢				2.808¢	2.808¢	(Bethlehem Massillon, Canton=2.808¢)					2.908¢		
Alloy, cold-drawn	3.484¢	3.484¢	3.484¢	3.484¢		3.484¢							3.584¢		
PLATE								(Coatesville and Claymont=2.50¢, Provo, Utah=3.20¢)							
Carbon steel[13]	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢		2.50¢	2.50¢			2.85¢	3.05¢	2.72¢	2.69¢	2.55¢
Floor plates	3.75¢	3.75¢									4.10¢	4.40¢		4.11¢	4.07¢
Alloy	3.64¢	3.64¢			(Coatesville=3.64¢)						4.108¢	4.316¢		3.64¢	3.73¢
SHAPES															
Structural	2.35¢	2.35¢	2.35¢		2.35¢	2.35¢	(Bethlehem=2.35¢)				2.60¢	3.00¢		2.52¢	2.465¢
SPRING STEEL, C-R															
0.26 to 0.50 carbon	3.05¢			3.05¢			(Worcester=3.25¢)								
0.51 to 0.75 carbon	4.65¢			4.65¢			(Worcester=4.85¢)								
0.76 to 1.00 carbon	6.65¢			6.65¢			(Worcester=6.85¢)								
1.01 to 1.25 carbon	9.03¢			9.03¢			(Worcester=9.23¢)								
WIRE[9]															
Bright[12]	3.05¢	3.05¢		3.05¢	3.05¢		(Worcester=3.15¢)		(Duluth=3.10¢)			3.55¢			3.37¢
Galvanized	Add proper size extra and galvanizing extra to Bright Wire Base														
Spring (high carbon)	3.65¢	3.65¢		3.65¢			(Worcester=3.75¢)					4.15¢			3.97¢
PILING															
Steel sheet	2.65¢	2.65¢				2.65¢						3.20¢			2.97¢

CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

BASING POINT	Chromium Nickel		Straight Chromium			
	No. 304	No. 302	No. 410	No. 430	No. 442	No. 446
Ingot, P'gh, Chi, Canton, Balt, Reading, Ft. Wayne, Phila.	Subject to negotiation			Subject to negotiation		
Blooms, P'gh, Chi, Canton, Phila, Reading, Ft. Wayne, Balt.	22.99	24.67	17.01	17.47	20.69	25.29
Slabs, P'gh, Chi, Canton, Balt, Phila, Reading	22.99	24.67	17.01	17.47	20.69	25.29
Billets, P'gh, Chi, Canton, Newark, N. J., Watervliet, Syracuse, Balt	Subject to negotiation			Subject to negotiation		
Billets, forging, P'gh, Chi, Canton, Dunkirk, Balt, Phila, Reading, Watervliet, Syracuse, Newark, N. J., Ft. Wayne, Titusville	22.99	24.67	17.01	17.47	20.69	25.29
Bars, h-r, P'gh, Chi, Canton, Dunkirk, Watervliet, Newark, N. J., Syracuse, Balt, Phila, Reading, Ft. Wayne, Titusville	27.05	25.97	20.02	20.56	24.34	29.75
Bars, c-f, P'gh, Chi, Cleve, Canton, Dunkirk, Newark, N. J., Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet	27.05	25.97	20.02	20.56	24.34	29.75
Plates, P'gh, Middletown, Canton	31.38	29.21	23.28	23.80	28.67	33.00
Shapes, structural, P'gh, Chi	27.05	25.97	20.02	20.56	24.34	29.75
Sheets, P'gh, Chi, Middletown, Canton, Balt.	38.95	36.79	28.67	31.38	35.16	38.49
Strip, h-r, P'gh, Chi, Reading, Canton, Youngstown	25.43	23.28	18.39	18.93	25.97	37.87
Strip, c-r, P'gh, Cleve, Newark, N. J., Reading, Canton, Youngstown	32.46	30.30	23.80	24.34	34.62	56.26
Wire, c-d, Cleve, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila.	27.05	25.97	20.02	20.56	24.34	29.75
Wire, flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton	32.46	30.30	23.80	24.34	34.62	56.26
Rod, h-r, Newark, N. J., Syracuse	27.05	25.97	20.02	20.56	24.34	29.75
Tubing, seamless, P'gh, Chi, Canton, (4 in. to 6 in.)	72.09	72.09	.....	68.49	.....	.....

SHELL STEEL

	per gross ton
3 in. to 12 in.	$52.00
12 in. to 18 in.	54.00
18 in. and over	56.00

Basic openhearth shell steel, f.o.b. Pittsburgh, Chicago, Buffalo, Gary, Cleveland, Youngstown and Birmingham.

Prices delivered Detroit are $2.00 higher; East Michigan, $3 higher.

Price Exceptions: Follansbee Steel Corp. permitted to sell at $13.00 per gross ton, f.o.b. Toronto, Ohio, above base price of $52.00.

Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting, or quantity.

ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

	per lb
Field grade	3.90¢
Armature	4.25¢
Electrical	4.75¢
Motor	5.425¢
Dynamo	6.125¢
Transformer 72	6.625¢
Transformer 65	7.625¢
Transformer 58	8.125¢
Transformer 52	8.925¢

F.o.b. Chicago and Gary, field grade through motor; f.o.b. Granite City, add 10¢ per 100 lb on field grade to and including dynamo. Pacific ports add 75¢ per 100 lb on all grades.

RAILS, TRACK SUPPLIES

(F.o.b. mill)

Standard rails, heavier than 60 lb	
No. 1 O.H., net ton	$43.39
Angle splice bars, 100 lb	2.85
(F.o.b. basing points)	*per net ton*
Light rails (from billets)	$49.18
Light rails (from rail steel)	48.29
	base per lb
Cut spikes	3.65¢
Screw spikes	5.55¢
Tie plate, steel	2.55¢
Tie plates, Pacific Coast	2.70¢
Track bolts	4.75¢
Track bolts, heat treated, to railroads	5.00¢
Track bolts, jobbers discount	63-5

Basing points, light rails, Pittsburgh, Chicago, Birmingham; cut spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo. Cut spikes alone—Youngstown, Lebanon, Pa., Richmond, Oregon and Washington ports, add 25¢.

TOOL STEEL

*(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. *Also Canton, O.)*
An increase of 8.2 pct applies to base price and extras

	Base per lb
High speed	67¢
Straight molybdenum	54¢
Tungsten-molybdenum	57½¢
High-carbon-chromium*	43¢
Oil hardening*	24¢
Special carbon*	22¢
Extra carbon*	18¢
Regular carbon*	14¢

Warehouse prices east of Mississippi are 2¢ per lb higher; west of Mississippi 3¢ higher.

CLAD STEEL

Base prices, cents per pound

	Plate	*Sheet*
Stainless-clad		
No. 304, 20 pct, f.o.b. Pittsburgh, Washington, Pa.	18.72*	19.76
Nickel-clad		
10 pct, f.o.b. Coatesville, Pa.	18.72	....
Inconel-clad		
10 pct, f.o.b. Coatesville	26.00	....
Monel-clad		
10 pct, f.o.b. Coatesville	24.96	....
Aluminized steel		
Hot dip, 20 gage, f.o.b. Pittsburgh	....	9.00

*Includes annealing and pickling.

WIRE PRODUCTS

To the dealer, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham, Duluth

	Basing Points Named	*Pacific Coast Basing Points†*
	base per keg	
Standard wire nails	$3.25	$3.75
Coated nails	3.25	3.75
Cut nails, carloads	3.85	....
	base per 100 lb	
Annealed fence wire	$3.50	$4.00
Annealed galv. fence wire	3.85	4.35
	base column	
Woven wire fence*	72	90
Fence posts, carloads	74	91
Single loop bale ties††	72	97
Galvanized barbed wire**	79	89
Twisted barbless wire	79	89

*15½ gage and heavier. **On 80-rod spools in carload quantities.

†Prices subject to switching or transportation charges.

††Add 50¢ a ton.

ROOFING TERNEPLATE

(F.o.b. Pittsburgh, 112 sheets)

	20x14 in.	20x28 in.
8-lb coating I.C.	$8.50	$17.00
15-lb coating I.C.	9.50	19.00
20-lb coating I.C.	10.00	20.00

ALLOY EXTRAS

Alloy Steel	Basic Openhearth		Electric Furnace	
	Bars and Bar-strip	Billets, Blooms and Slabs	Bars and Bar-strip	Billets, Blooms and Slabs
NE 8600	0.676¢	$13.52	1.196¢	$23.92
NE 8700	0.728	14.56	1.248	24.96
NE 9400	0.780	15.60	1.300	26.00
NE 9700	0.676	13.52	1.196	23.92
NE 9800	1.352	27.04	1.872	37.44
NE 9900	1.248	24.96	1.612	32.24

The extras shown are in addition to the base price of $2.808 per 100 lb on finished products and $56.16 per gross ton on semifinished steel, major basing points, as shown in table, opposite page, and are in cents per pound when applicable to bars and bar-strip and in dollars per gross ton when applicable to billets, blooms and slabs. When acid openhearth is specified and acceptable, add to basic openhearth alloy differential 0.26¢ per lb for bars and bar-strip and $5.20 per gross ton for billets, blooms and slabs.

WELDED PIPE AND TUBING

Base discounts, f.o.b. Pittsburgh district and Lorain, Ohio, mills

(F.o.b. Pittsburgh only on wrought pipe) base price—$200.00 per net ton

Steel (buttweld)

	Black	Galv.
⅛-in.	60½	48
¼-in.	63½	52
1-in. to 3-in.	65½	54½

Wrought Iron (buttweld)

⅛-in.	18	+4
¼-in.	24	2½
1-in. and 1¼-in.	28½	9
1½-in.	33	12
2-in.	32	11

Steel (lapweld)

2-in.	58	46½
2½-in. and 3-in.	61	49½
3½-in. to 6-in.	63	51½

Wrought Iron (lapweld)

2-in.	25	4½
2½-in. to 3½-in.	26	7
4-in.	28	11
4½-in. to 8-in.	27	10

Steel (butt, extra strong, plain ends)

⅛-in.	58½	47½
¼-in.	62½	51½
1-in. to 3-in.	64	54

Wrought Iron (same as above)

⅛-in.	19	+1½
¼-in.	25	4½
1-in. to 2-in.	33	13

Steel (lap, extra strong, plain ends)

2-in.	56	45½
2½-in. and 3-in.	60	49½
3½-in. to 6-in.	63½	53

Wrought Iron (same as above)

2-in.	28	8½
2½-in. to 4-in.	34	16
4½-in. to 6-in.	32	14½

On buttweld and lapweld steel pipe jobbers are granted a discount of 5 pct. On l.c.l. shipments prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or $4 a ton higher than Pittsburgh or Lorain on lapweld and one point lower discount, or $2 a ton higher on all buttweld.

BOILER TUBES

Seamless steel and lapweld commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft f.o.b. Pittsburgh, in carload lots

	Seamless Cold-Drawn	Hot-Rolled	Lap-weld, Hot-Rolled
2 in. O.D. 13 B.W.G.	16.52	13.90	13.20
2½ in. O.D. 12 B.W.G.	22.21	18.70	17.67
3 in. O.D. 12 B.W.G.	24.71	20.79	19.56
3½ in. O.D. 11 B.W.G.	31.18	26.25	24.68
4 in. O.D. 10 B.W.G.	38.68	32.56	30.55

(Extras for less carload quantities)

40,000 lb or ft and over	Base
30,000 lb or ft to 39,999 lb or ft	5 pct
20,000 lb or ft to 29,999 lb or ft	10 pct
10,000 lb or ft to 19,999 lb or ft	20 pct
5,000 lb or ft to 9,999 lb or ft	30 pct
2,000 lb or ft or 4,999 lb or ft	45 pct
Under 2,000 lb or ft	65 pct

CAST IRON WATER PIPE

Per Net Ton

6-in. and larger, del'd Chicago	$60.80
6-in. and larger, del'd New York	60.20
6-in. and larger, Birmingham	52.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles or Seattle	74.00

For all rail shipment; rail and water shipment less.

Class "A" and gas pipe, $3 extra; 4-in. pipe is $5 a ton above 6-in.

BOLTS, NUTS, RIVETS, SET SCREWS

An increase of 7 pct applies to all listings.

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts

Base discount less case lots

Percent Off List

½ in. & smaller x 6 in. & shorter	65½
9/16 & ⅝ in. x 6 in. & shorter	63½
¾ to 1 in. x 6 in. & shorter	61
1⅛ in. and larger, all lengths	59
All diameters over 6 in. long	59
Lag, all sizes	62
Plow bolts	65

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

½ in. and smaller	62
9/16 to 1 in. inclusive	59
1⅛ to 1½ in. inclusive	57
1⅝ in. and larger	56

On above bolts and nuts, excepting plow bolts, additional allowance of 10 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semifin. Hexagon Nuts	U.S.S.	S.A.E.
Base discount less keg lots		
7/16 in. and smaller	..	64
½ in. and smaller	62	..
½ in. through 1 in.	..	60
9/16 in. through 1 in.	59	..
1⅛ in. through 1½ in.	57	58
1⅝ in. and larger	56	..

In full keg lots, 10 pct additional discount.

Stove Bolts

	Consumer
Packages, nuts loose	71 and 10
In packages	71
In bulk	80

On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.

Large Rivets

(½ in. and larger)

	Base per 100 Lb
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	$3.75

Small Rivets

(7/16 in. and smaller)

	Percent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	65 and 5

Cap and Set Screws	*Consumer* *Percent Off List*
Upset full fin, hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in.	64
Upset set screws, cup and oval points	71
Milled studs	46
Flat head cap screws, listed sizes	36
Fillister head cap, listed sizes	51

Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.

FLUORSPAR

Maximum price f.o.b. consumer's plant, $30 per short ton plus either (1) rail freight from producer to consumer, or (2) rail freight from Rosiclare, Ill., to consumer, whichever is lower.

Exception

When the WPB Steel Div. certifies in writing the consumers need for one of the higher grades of metallurgical fluorspar specified in the table below the price shall be taken from the table plus items (1 and 2) from paragraph above.

Effective CaF_2 Content:	*Base price per short ton*
70% or more	$33.00
65% but less than 70%	32.00
60% but less than 65%	31.00
Less than 60%	30.00

METAL POWDERS

Prices are based on current market prices of ingots plus a fixed figure. F.o.b. shipping point, cents per lb, ton lots.

Copper, electrolytic, 150 and 200 mesh	21½¢ to 23½¢
Copper, reduced, 150 and 200 mesh	20½¢ to 25½¢
Iron, commercial, 100 and 200 mesh 96 + % Fe	12½¢ to 15¢
Iron, crushed, 200 mesh and finer, 90 + % Fe carload lots	4¢
Iron, hydrogen reduced, 300 mesh and finer, 98½ + % Fe, drum lots	63¢
Iron, electrolytic, unannealed, 300 mesh and coarser, 99 + % Fe	30 to 33¢
Iron, electrolytic, annealed minus 100 mesh, 99 + % Fe	42¢
Iron carbonyl, 300 mesh and finer, 98-99.8 + % Fe	90¢
Aluminum, 100 and 200 mesh	*35¢
Antimony, 100 mesh	30¢
Cadmium, 100 mesh	$1.40
Chromium, 100 mesh and finer	$1.25
Lead, 100, 200 & 300 mesh	11½ to 15¢
Manganese	65¢
Nickel, 150 mesh	51½¢
Solder powder, 100 mesh	38½¢ plus metal
Tin, 100 mesh	58¾¢
Tungsten metal powder, 98%-99%, any quantity, per lb	$2.60
Molybdenum powder, 99%, in 200-lb kegs, f.o.b. York, Pa., per lb	$2.60
Under 100 lb	$3.00

*Freight allowed east of Mississippi.

COKE

Furnace, beehive (f.o.b. oven)	**Net Ton**
Connellsville, Pa.	$7.50*
Foundry, beehive (f.o.b. oven)	
Fayette Co., W. Va.	8.10
Connellsville, Pa.	9.00
Foundry, Byproduct	
Chicago, del'd	13.75
Chicago, f.o.b.	13.00
New England, del'd	14.65
Kearny, N. J., f.o.b.	13.05
Philadelphia, del'd	13.28
Buffalo, del'd	13.40
Portsmouth, Ohio, f.o.b.	11.50
Painesville, Ohio, f.o.b.	12.15
Erie, del'd	13.15
Cleveland, del'd	13.20
Cincinnati, del'd	13.25
St. Louis, del'd	13.75†
Birmingham, del'd	10.90

*Hand drawn ovens using trucked coal permitted to charge $8.60 per ton plus transportation charges.

†Except producers situated in states other than Missouri, Alabama or Tennessee, sellers may charge a maximum delivered price of $14.25 in the St. Louis, Mo., and East St. Louis, Ill., switching districts.

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick*	*Per 1000*
Super-Duty brick, St. Louis	$76.05
First quality, Pa., Md., Ky., Mo., Ill.	60.40
First quality, New Jersey	65.90
Sec. quality, Pa., Md., Ky., Mo., Ill.	54.80
Sec. quality, New Jersey	57.70
No. 1 Ohio	50.00
Ground fire clay, net ton	8.95

Silica Brick*	
Pennsylvania and Birmingham	$60.40
Chicago District	69.30
Silica cement, net ton (Eastern)	10.60

Chrome Brick	*Per Net Ton*
Standard chemically bonded, Balt., Plymouth Meeting, Chester	$54.00

Magnesite Brick	
Standard, Balt. and Chester	$76.00
Chemically bonded, Baltimore	65.00

Grain Magnesite	
Domestic, f.o.b. Balt. and Chester in sacks (carloads)	$48.48
Domestic, f.o.b. Chewelah, Wash. in bulk	22.00
in sacks	26.00

*Retroactive to Apr. 1.

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports*)

	Per Gross Ton
Old range, bessemer, 51.50	$4.95
Old range, non-bessemer, 51.50	4.80
Mesaba, bessemer, 51.50	4.70
Mesaba, non-bessemer, 51.50	4.55
High phosphorus, 51.50	4.35

*Adjustments are made to indicate prices based on variance of Fe content of ores as analyzed on a dry basis by independent laboratories.

WAREHOUSE PRICES

Delivered metropolitan areas per 100 lb. These are zoned warehouse prices in conformance with latest zoning amendment to OPA Price Schedule 49.

Cities	SHEETS			STRIP			Plates ¼ in. and heavier	Structural Shapes	BARS		ALLOY BARS			
				Hot-Rolled										
	Hot-Rolled (10 gage)	Cold-Rolled	Galvanized (24 gage)	6 in. and Under	Over 6 in.	Cold-Rolled			Hot-Rolled	Cold-Finished	Hot-Rolled, NE 8617-20	Hot-Rolled, NE 8742-50 Ann.	Cold-Drawn, NE 8617-20	Cold-Drawn, NE 8742-50 Ann.
**Philadelphia	$3.743	$5.097	$5.218a	$4.272	$4.172	$5.022	$3.855	$3.916	$4.072	$4.522	$6.016	$7.216	$7.372	$8.522
New York	3.815	4.838[3]	5.46	4.524	4.224	5.024	4.018	4.008	4.103	4.553	6.058	7.158	7.403	8.453
Boston	3.999	4.969[9]	5.674	4.456	4.356	4.965	4.162	4.162	4.294	4.594	6.212	7.312	7.444	8.494
Baltimore	3.619	5.077	5.344	4.252	4.152	....	3.844	4.009	4.052	4.502	....	....	....	....
Norfolk	3.996	....	5.821	4.515	4.415	....	4.221	4.252	4.315	4.615	....	....	....	....
Chicago	3.475	4.425	5.581	3.95	3.85	4.90[17]	3.80	3.80	3.75	4.20	....	....	....	....
Milwaukee	3.612	4.562[3]	5.537	4.087	4.077	5.037[17]	3.937	3.937	3.887	4.337	6.037	7.037	7.187	8.237
Cleveland	3.575	4.625	5.327	3.95	3.85	4.70[17]	3.65	3.838	3.60	4.20	6.006	....	6.95	....
Buffalo	3.575	4.625	5.104	4.169	4.069	4.919	3.88	3.65	3.60	4.20	5.80	6.90	7.95	8.00
Detroit	3.675	4.725	5.45	4.05	3.95	....	3.859	3.911	3.70	4.25	6.13	....	7.259	....
Cincinnati	3.65	4.70[3]	5.275	4.025	3.925	4.961	3.911	3.941	3.861	4.461	6.15	....	7.311	....
St. Louis	3.622	4.572[3]	5.581	4.097	3.997	5.181[17]	3.947	3.947	3.897	4.481	6.181	....	7.331	....
Pittsburgh	....	....	....	....	....	....	....	....	....	4.20	....	....	....	....
St. Paul	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Omaha	4.018	5.668	5.965	4.343	4.243	....	4.343	....	4.293	4.893	....	....	....	....
Indianapolis	3.745	4.795	5.37	4.12	4.02	4.99	3.88	3.88	3.83	4.43	6.13	....	7.28	....
Birmingham	3.675	....	5.20	....	....	....	3.80	3.80	3.75	4.903	....	....	....	....
Memphis	4.19	4.885	5.715	4.565	4.465	....	4.315	4.315	4.265	4.78	....	....	....	....
New Orleans	4.283*	5.304	5.808	4.658	4.558	....	4.408	4.408*	4.358*	5.079	....	....	....	....
Houston	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Los Angeles	5.00	7.20[3]	....	4.95	4.85	....	4.95	4.65	4.40	5.683	....	....	....	....
San Francisco	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Seattle	4.87[12]	7.27[4]	6.40	4.60	4.50	....	5.00[12]	4.70[12]	4.60[12]	6.23	....	....	....	....
Portland	4.87[11]	6.82[4]	6.20	5.10	5.00	....	5.00[11]	4.70[11]	4.70[11]	5.98	8.15	....	9.20	....
Salt Lake City	....	....	....	....	....	....	....	....	....	....	....	....	....	....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1499 lb; strip, extras on all quantities; bars, 1500 lb base.

NE ALLOY BARS: 1000 to 39,999 lb.

GALVANIZED SHEETS: 450 to 1493 lb.

EXCEPTIONS: (1) 150 to 499 lb. (2) 150 to 1499 lb. (3) 400 to 1499 lb. (4) 450 to 1499 lb. (5) 500 to 1499 lb. (6) 0 to 199 lb. (7) 400 to 1499 lb. (8) 1000 to 1999 lb. (9) 450 to 3749 lb. (10) 400 to 3999 lb. (11) 300 to 4999 lb. (12)) 300 to 10,000 lb. (13) 400 to 14,999 lb. (14) 400 lb and over. (15) 1000 lb and over. (16) 1500 lb and over. (17) 2000 lb and over. (18) 3500 lb and over.

(a) Philadelphia: Galvanized sheet, 25 or more bundles.

Extra for size, quality, etc., apply on above quotations.

* Add 0.271¢ for sizes not rolled in Birmingham.

** City of Philadelphia only. Applicable freight rates must be added to basing point prices to obtain delivered price to other localities in metropolitan area.

PIG IRON PRICES

Maximum per gross ton, effective Mar. 15, 1946.
Prices do not reflect 3 pct tax on freight.

BASING POINT PRICES					
Basing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	27.00	27.50	28.00	28.50	.....
Birdsboro	27.00	27.50	28.00	28.50	32.00
Birmingham	21.50	22.88	.....	27.50	.....
Buffalo	25.50	26.50	27.00	27.50	32.00
Chicago	26.00	26.50	26.50	27.00	.....
Cleveland	26.00	26.50	26.50	27.00	.....
Detroit	26.00	26.50	26.50	27.00	.....
Duluth	26.50	27.00	27.00	27.50	.....
Erie	26.00	26.50	27.00	27.50	.....
Everett	27.00	27.50	28.00	28.50	.....
Granite City	26.00	26.50	26.50	27.00	.....
Hamilton	26.00	26.50	26.50	.....	.....
Neville Island	26.00	26.50	26.50	27.00	.....
Provo	24.00	24.50	.....	.....	.....
Sharpsville[1]	26.00	26.50	26.50	27.00	.....
Sparrows Point	27.00	27.50	.....	.....	.....
Steelton	27.00	.....	.....	.....	32.00
Swedeland	27.00	27.50	28.00	28.50	.....
Toledo	26.00	26.50	26.50	27.00	.....
Youngstown	26.00	26.50	26.50	27.00	.....

DELIVERED PRICES (BASE GRADES)							
Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	0.50	27.50	28.00	28.50	29.00	.....
Boston	Birdsboro-Steelton	4.02	.....	.....	.....	.....	36.02
Brooklyn	Bethlehem	2.50	29.50	30.00	30.50	31.00	.....
Brooklyn	Birdsboro	2.92	.....	.....	.....	.....	34.92
Canton	Clev.Ygstn,Sharpsvil.	1.39	27.39	27.89	27.89	28.39	.....
Canton	Buffalo	3.19	.....	.....	.....	.....	35.19
Cincinnati	Birmingham	4.06	25.56	26.94	.....	.....	.....
Cincinnati	Hamilton	1.11	.....	.....	27.61	.....	.....
Cincinnati	Buffalo	4.40	.....	.....	.....	.....	36.40
Jersey City	Bethlehem	1.53	28.53	29.03	29.53	30.03	.....
Jersey City	Birdsboro	1.94	.....	.....	.....	.....	33.94
Los Angeles	Provo	4.95	28.95	29.45	.....	.....	.....
Los Angeles	Buffalo	15.41	.....	.....	.....	.....	47.41
Mansfield	Cleveland-Toledo	1.94	27.94	28.44	28.44	28.94	.....
Mansfield	Buffalo	3.36	.....	.....	.....	.....	35.36
Philadelphia	Swedeland	0.84	27.84	28.34	28.84	29.34	.....
Philadelphia	Birdsboro	1.24	.....	.....	.....	.....	33.24
San Francisco	Provo	4.95	28.95	29.45	.....	.....	.....
San Francisco	Buffalo	15.41	.....	.....	.....	.....	47.41
Seattle	Provo	4.95	28.95	29.45	.....	.....	.....
Seattle	Buffalo	15.41	.....	.....	.....	.....	47.41
St. Louis	Granite City	0.50	26.50	27.00	27.00	27.50	.....
St. Louis	Buffalo	7.07	.....	.....	.....	.....	39.07

(1) Struthers Iron & Steel Co., Struthers, Ohio, may charge 50¢ per ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable.

Charcoal pig iron base prices for Lyles, Tenn., and Lake Superior furnaces, $33.00 and $34.00, respectively. Newberry Brand of Lake Superior charcoal iron $39.00 per g.t., f.o.b. furnace, by order L 39 to RPS 10. Apr. 11, 1945, retroactive to Mar. 7, 1945. Delivered to Chicago, $42.34. High phosphorus iron sells at Lyles, Tenn., at $28.50.

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorous content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00 pct. Effective Mar. 3, 1943, $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron and bessemer ferrosilicon up to and including 14.00 pct silicon covered by RPS 10 as amended. Silvery iron, silicon 6.00 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—$32.00; f.o.b. Buffalo—$33.25. Add $1.00 per ton for each additional 0.50 pct Si. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for prices of comparable analysis.

Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Philadelphia, New York, Birmingham, Rockdale, Rockwood, Tenn.

Carload lots (bulk)	$135.00
Less ton lots (packed)	148.50
F.o.b. Pittsburgh	139.50

$1.70 for each 1% above 82% Mn; penalty, $1.70 for each 1% below 78%.

Briquets—per pound of briquet, freight allowed, 66% contained Mn.

	Eastern	Central	Western
Carload, bulk	6.05¢	6.30¢	6.60¢
Ton lots	6.65¢	7.55¢	8.55¢
Less ton lots	6.80¢	7.80¢	8.80¢

Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Carloads	$35.00	$36.00
Less ton	47.50	48.50
F.o.b. Pittsburgh, Chicago	40.00	

Manganese Metal

Contract basis, lump size, per pound of metal, f.o.b. shipping point, freight allowed.

96-98% Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, bulk	30¢
L.c.l. lots	32¢

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	34¢
Ton lots	36¢
Less ton lots	38¢

Low-Carbon Ferromanganese

Contract price per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.

	Carloads	Ton	Less
0.10% max. C, 0.06% P, 90% Mn	21.00¢	21.40¢	21.65¢
0.10% max. C	20.50¢	20.90¢	21.15¢
0.15% max. C	20.00¢	20.40¢	20.65¢
0.30% max. C	19.50¢	19.90¢	20.15¢
0.50% max. C	19.00¢	19.40¢	19.65¢
0.75% max. C, 7.00% max. Si	16.00¢	16.40¢	16.65¢

Silicomanganese

Contract basis, lump size, per pound of metal, f.o.b. shipping point, freight allowed. 65-70% Mn, 17-20% Si, 1.5% max. C.

Carload, bulk	6.05¢
Ton lots	6.70¢
Briquet, contract basis, carlots, bulk, freight allowed, per lb. of briquet	5.80¢
Ton lots	6.30¢
Less ton lots	6.55¢

Silvery Iron (electric furnace)

Si 14.01 to 14.50%, $48.75 f.o.b. Keokuk, Iowa; $46.75 f.o.b. Niagara Falls. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 per ton for low impurities, not to exceed: P—0.05%, S—0.04%, C—1.00%. Covered by MPR 405.

Silicon Metal

Contract price per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots, packed.

	Eastern	Central	Western
96% Si, 2% Fe	13.10¢	13.55¢	16.50¢
97% Si, 1% Fe	13.45¢	13.90¢	16.80¢

Ferrosilicon Briquets

Contract price per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination. 40% Si.

	Eastern	Central	Western
Carload, bulk	3.35¢	3.50¢	3.65¢
Ton lots	3.80¢	4.20¢	4.25¢

Electric Ferrosilicon

Contract price per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
50% Si	6.65¢	7.10¢	7.25¢
75% Si	8.05¢	8.20¢	8.75¢
80-90% Si	8.90¢	9.05¢	9.55¢
90-95% Si	11.05¢	11.20¢	11.65¢

Ferrochrome (65-72% *Cr, 2% max. Si*)

Contract prices per pound, contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
0.06% C	23.00¢	23.40¢	24.00¢
0.10% C	22.50¢	22.90¢	23.50¢
0.15% C	22.00¢	22.40¢	23.00¢
0.20% C	21.50¢	21.90¢	22.50¢
0.50% C	21.00¢	21.40¢	22.00¢
1.00% C	20.50¢	20.90¢	21.50¢
2.00% C	19.50¢	19.90¢	20.50¢
66-71% Cr, 4-10% C	13.00¢	13.40¢	14.00¢
62-66% Cr, 5-7% C	13.50¢	13.90¢	14.50¢

Briquets—contract price per pound of briquet, f.o.b. shipping point, freight allowed. 60% chromium.

	Eastern	Central	Western
Carload, bulk	8.25¢	8.55¢	8.95¢
Ton lots	8.75¢	9.25¢	10.75¢
Less ton lots	9.00¢	9.50¢	11.00¢

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low-carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N. High-carbon type: 66-71% Cr, 4-5% C, 0.75% N. Add 5¢ per lb to regular high-carbon ferrochrome price schedule.

S. M. Ferrochrome

Contract price per pound chromium contained, lump size, f.o.b. shipping point, freight allowed.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

	Eastern	Central	Western
Carload	14.00	14.40	15.00
Ton lots	14.90	15.55	16.75
Less ton lots	15.40	16.05	17.25

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25 max. C.

	Eastern	Central	Western
Carload	20.00	20.40	21.00
Ton lots	21.00	21.65	22.85
Less ton lots	22.00	22.65	23.85

Chromium Metal

Contract prices per pound, chromium contained, carload, f.o.b. shipping point, freight allowed. 97% min. Cr, 1% max. Fe.

	Eastern	Central	Western
0.20% max. C	83.50	85.00	86.25
0.50% max. C	79.50	81.00	82.25
9.00% min. C	79.50	81.00	82.25

Chromium—Copper

Contract price per pound of alloy, f.o.b. Niagara Falls, freight allowed east of the Mississippi. 8-11% Cr, 88-90% Cu, 1.00% max. Fe, 0.50% max. Si.

Shot or ingot	45¢

Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.

30-35% Ca, 60-65% Si, 3.00% max. Fe or 28-32% Ca, 60-65% Si, 6.00% max. Fe.

	Eastern	Central	Western
Carloads	13.00	13.50	15.55
Ton lots	14.50	15.25	17.40
Less ton lots	15.50	16.25	18.40

Calcium—Manganese—Silicon

Contract prices per pound of alloy, lump, f.o.b. shipping point, freight allowed.

16-20% Ca, 14-18% Mn, 53-59% Si.

	Eastern	Central	Western
Carloads	15.50¢	16.00¢	18.05¢
Ton lots	16.50¢	17.35¢	19.10¢
Less ton lots	17.00¢	17.85¢	19.60¢

Calcium Metal

Eastern zone contract prices per pound of metal, f.o.b. shipping point, freight allowed. Add 1¢ for central zone; 5¢ for western zone.

	Cast	Turnings	Distilled
Ton lots	$1.35	$1.75	$4.25
Less ton lots	1.60	2.00	5.00

CMSZ

Contract price per pound of alloy, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C. Ton lots	12.00¢	12.75¢	14.75¢
Less ton lots	12.50¢	13.25¢	15.25¢
Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C. Ton lots	11.75¢	12.50¢	14.50¢
Less ton lots	12.25¢	13.00¢	15.00¢

SMZ

Contract price per pound of alloy, f.o.b. shipping point, freight allowed. 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe.

	Eastern	Central	Western
Ton lots	12.00¢	12.85¢	14.60¢
Less ton lots	12.50¢	13.35¢	15.10¢

Other Ferroalloys

Ferrotungsten, standard, lump or ¼X down, packed, f.o.b. plant Niagara Falls, Washington, Pa., York, Pa., per pound contained T, 5 ton lots, freight allowed	$1.88
Ferrovanadium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V	
Openhearth	$2.70
Crucible	$2.80
High speed steel (Primos)	$2.90
Vanadium pentoxide, 88-92% V_2O_5 technical grade, contract basis, per pound contained V_2O_5	$1.10
Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb. Ton lots	$2.25
Less ton lots	$2.30
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo	95¢
Calcium molybdate, 40-45¢, f.o.b. Langeloth, Washington, Pa., per pound contained Mo	80¢
Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo	80¢
Molybdenum oxide, in cans, f.o.b. Langeloth and Washington, Pa., per pound contained Mo	80¢
Ferrotitanium, 40-45%, 0.10%C max., f.o.b. Niagara Falls, N. Y., ton lots, per pound contained Ti	$1.23
Less ton lots	$1.25
Ferrotitanium, 20-25%, 0.10%C max., ton lots, per pound contained Ti	$1.35
Less ton lots	$1.40
High-carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads	$142.50
Ferrophosphorus, 18%, electric or blast furnaces, f.o.b. Anniston, Ala., carlots, with $3 unitage freight equalled with Rockdale, Tenn., per gross ton	$58.50
Ferrophosphorus, Electrolytic, 23-26%, carlots, f.o.b. Monsanto (Sigio), Tenn., $3 unitage freight equalized with Nashville, per gross ton	$75.00
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy. Carload lots	14¢
Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy Carload, bulk	4.60¢
Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Niagara Falls, carload	5.75¢
Ton lots	7.25¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound. Car lots	8.00¢
Ton lots	8.75¢
Less ton lots	9.25¢

Boron Agents

Contract prices per pound of alloy, f.o.b. shipping point, freight allowed. Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.

	Eastern	Central	Western
Less ton lots	$1.30	$1.3075	$1.329

Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C.

Ton lots	$1.89	$1.903	$1.935
Less ton lots	2.01	2.023	2.055

Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.

Less ton lots	$2.10	$2.1125	$2.1445

Silcaz No. 3, contract basis, f.o.b. plant, freight allowed, per pound of alloy. Carload lots	25¢
Ton lots	26¢
Silvaz No. 3, contract basis, f.o.b. plant, freight allowed, per pound of alloy. Carload lots	58¢
Ton lots	59¢
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 50 lb and over. No. 1	87.5¢
No. 6	50¢
No. 79	45¢
Bortram, f.o.b. Niagara Falls Ton lots, per pound	45¢
Less ton lots, per pound	50¢

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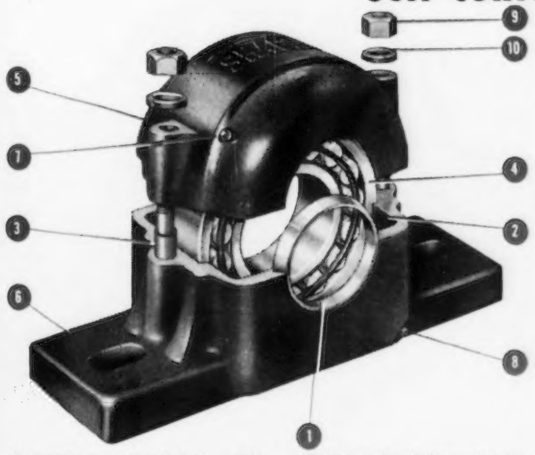

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2. Big lubricant reservoir means better lubricated, *cooler* bearing.

3. "Positive alignment" dowel bolts. Provide quiet, sure alignment of cap, bearing and base. No need for separate dowels.

4. The famous Shafer Self-Contained, Self-Aligning Roller Bearing. In straight bore or tapered bore for adapter mounting.

5. Pillow block cap precision machined to contour of bearing and seals, dowel-fitted to base.

6. Pillow block base, for 2 or 4 bolt mounting. Precision machined to contour of bearing and seals, dowel-fitted to cap.

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IMPORTANT The statements made here are taken from the daily experience of some of industry's most important production foundries.

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Jominy Reviews Our Metals Developments Since First World War

Chicago

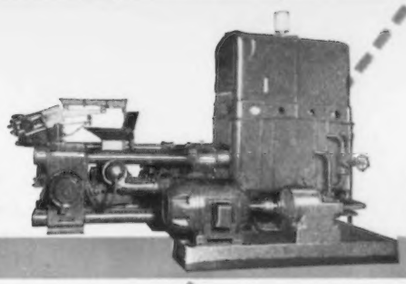
• • • **High temperature alloys** which will withstand stress of 25,000 psi at 1500° F for 1000 hr before rupture, with low creep, have been developed, Walter E. Jominy, Chrysler Corp., told the April meeting of the Chicago chapter of the American Society for Metals in a discussion of developments in aircraft metallurgy since World War I.

Mr. Jominy

Jominy listed 27 developments in metals and methods which have taken place during the period. Reviewing his experiences as chief metallurgist of the Dodge-Chicago plant, he discussed the most important innovations affecting that plant's operation. Use of a porous chrome plate on piston rings and cylinder barrels contributed to the elimination of frettage and played an important part in reducing failures, he said. Attention was given to increased use of stainless steel for springs, fuel lines and screens, with columbium and titanium added to the steel as a stabilizer.

The introduction of magnesium ranked as one of the important material developments, with considerable control required in melting, heat treating, and design. Mr. Jominy regarded cost as a principal determining factor in increased peacetime use, predicting that the metal would prove most competitive where much machining was required.

The history of aircraft bearings between wars was related, starting with babbitt bearings on bronze backings in the Liberty engine. Because backing material proved to be an important element in bearing failure, steel was introduced during this war because of its higher modulus of elasticity. Following a flash of nickel or copper on steel, silver plating in thicknesses of 0.005 to 0.016 in. was added with lead plated on the silver to prevent scoring when running-in the engine. The lead then was plated with indium to prevent attack by

THIS IS THE  MACHINE THAT

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Bulky scrap metal from machining and milling operations becomes a more profitable by-product when compressed into compact briquettes with a Milwaukee Hydraulic Press. Many large industrial plants throughout the nation have found that this modern method of conserving metal pays *in space saved, in the higher percentage of materials reclaimed, in lower melting costs.*

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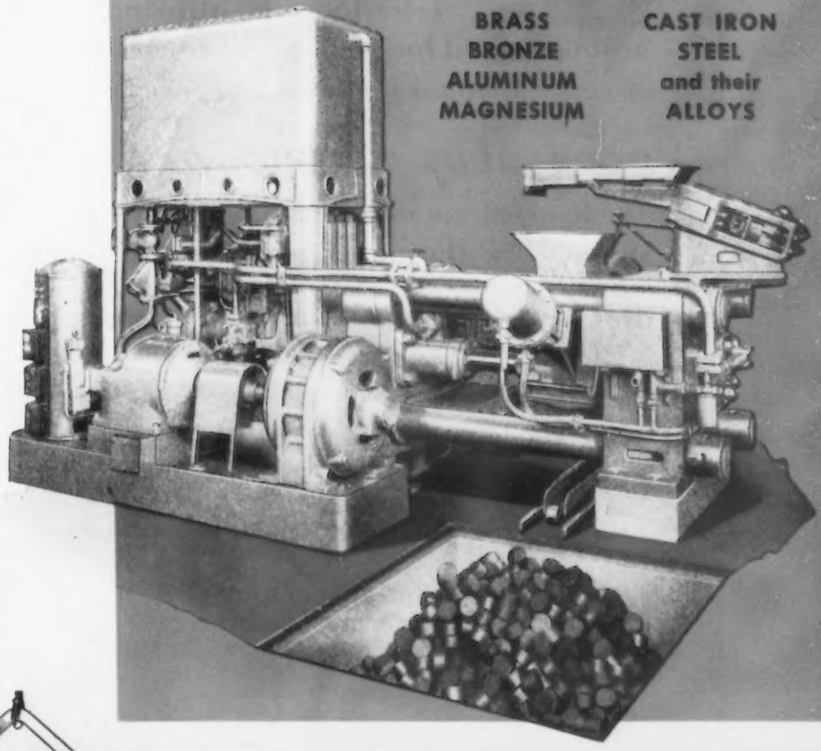

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oil and to produce a bearing with good heat and corrosion resistance.

Broad use of nitriding to develop high surface hardness, and resistance to wear and fatigue on highly stressed parts was discussed as a major development. The high cost of nitralloy steel was seen as a barrier to its peacetime use, but the use of other nitrided steels was outlined as an alternative. The speaker pointed out that nitriding of SAE 4340 steel increased fatigue resistance as much as 25 pct.

Examples of the advantageous use of hardenability tests in choosing steels were described, and current hardenability controversies discussed.

De-Control Action On Prices Moves Swiftly

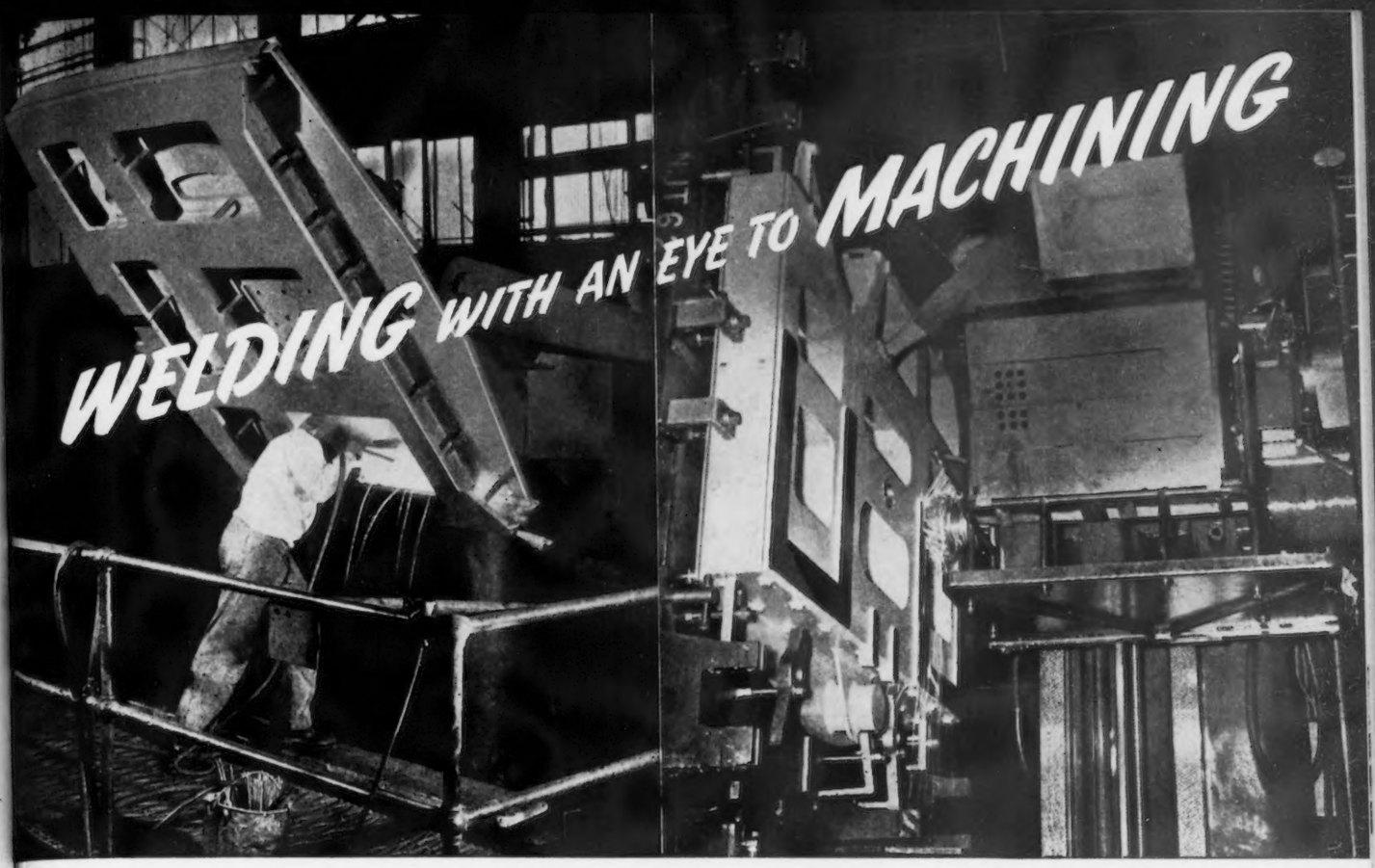
Chicago

• • • **The Office of** Price Administration is approaching price decontrol "aggressively and with the purpose of getting out as fast as is consistent with stabilization and with the knowledge that we are taking some risks," John M. Bulkley, assistant deputy administrator, Office of Price Administration, told the Chicago Assn. of Commerce here recently.

Because of administrative unfeasibility of developing a set of standards which would apply to all items equally, the agency is dealing with each item on its own merits in relation to general standards set down by Office of Economic Stabilization Directive No. 68. No individual has a vested right to have his product de-controlled at any particular time, Mr. Bulkley pointed out.

A few items still will be under price control by the end of 1948, Mr. Bulkley intimated, in the speech, which was made prior to action by the House of Representatives aimed toward limiting OPA power.

De-control action will come first on products which have the least significance in living and business costs, the speaker declared, pointing out that its most important work today was the tremendous volume of pricing problems arising from the government's policy on wages and prices. Speedy action on these problems will allow quick attention to more important products remaining under price control.



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1 ***Known quality of welding.*** Flaw-free welding to close tolerances makes for effective reductions in the cost of machining. Rough cuts are fewer or may be eliminated entirely.

2 ***The job should be of volume quantity.*** Repetition makes for greater efficiency, and tooling costs lower as they are spread over volume production.

3 ***Facilities must be adequate to handle the job.*** In Danly's modern plant are the welding facilities, machine tools, normalizing furnaces, shot blast equipment, handling equipment, X-ray, Magnaflux, and complete inspection facilities for producing and delivering your job to any desired specifications at lower *final cost.*

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THE manufacture of electrical equipment, involving the use of thousands upon thousands of parts ranging from tiny nuts and bolts to heavy castings and large reels of wire and strap copper, creates an unusually varied handling problem. To one prominent manufacturer, faced with increased production schedules, this problem was complicated still more because production operations had to be carried on in and between several connected buildings.

Analysis of the problem revealed the need of a handling system capable of transporting materials and partially-finished products of varying sizes, shapes and weights between production operations. Towmotor, the modern materials handling system, was chosen because of its ability to operate with heavy loads under low ceilings, to carry loads up steep inclines and through narrow aisle-ways. Particularly important was its flexibility which permitted switching quickly from one task to another. It could and does work regularly in receiving, stores, machine shops, heavy assembly and shipping. Now, without having had to rearrange machinery, production has been increased, man hour handling costs have been reduced and personnel safety has been measurably improved.

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TAKE IT UP WITH

TOWMOTOR

THE ONE-MAN-GANG

Army-Navy-Civilian Group Set to Make V-2 Rocket Tests

Washington

• • • **Maj. Gen. Gladeon M. Barnes,** Chief of Research & Development Service, Ordnance Dept., under whose direction the first German V-2 rockets will be fired about May 8 at White Sands, N. Mex., announced recently that an advisory board consisting of Army, Navy and Aeronautics officials has been appointed to supervise the V-2 firing program.

Members appointed to the Advisory Committee are Com. T. J. Killian and Com. O. N. Spain, Navy Dept.; Col. M. F. Cooper, Army Air Forces; J. W. Crowley, National Advisory Committee for Aeronautics; Col. Hobart Hewitt, Army Ground Forces; and Maj. J. E. Keeley, Signal Corps. Gen. Barnes is Chairman of the Advisory Committee.

Twenty-five rockets are being assembled by General Electric engineers from bits and parts salvaged from the battlefields and an underground assembly plant in Europe. Ordnance Technical Intelligence Teams scoured the European theater for complete serviceable V-2 assemblies without success. The firings will continue at White Sands at a rate of about one a week until the 25 rockets are expended.

Col. Holger N. Toftoy, Ordnance Rocket Development Chief, describes the spectacular German V-2's as huge 46-ft missiles 65 in. in diam., weighing 28,000 lb each. The overall span of each pair of fins is nearly 12 ft. Warhead attachments weighing 2200 lb which normally carry the rocket's potent explosive charges, are being fitted with instruments to study the physics of the upper atmosphere.

The experiment offers scientists their first opportunity to study physical phenomena of cosmic rays and propagation properties of atmosphere at an altitude of 100 miles. Only half this distance has been achieved by the Germans in previous flights against targets in Europe.

The motivating power which sends the rocket zooming into space is derived from the alcohol and liquid oxygen fuel mixture

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which takes up about 60 pct of the total weight of the rocket.

The rockets, according to Col. James G. Bain, Chief of the Guided Missiles Branch of the Ordnance Dept., are tested on a "static firing platform" emplaced near a 100,000 gal water tank. The platform consists of a large concrete base, surmounted by a steel tower which holds the V-2 in place while the motor is being tested. Scorching flames from the combustion chamber escape through a vent in the concrete base out onto the desert, while rocket experts safely watch the experiment from a sandbagged structure housing the ground controls.

A pyrotechnic pinwheel, fired by electric sparks, whirls shooting streams of fire into the rocket which ignites the fuel being injected into the combustion chamber and sends the 14-ton projectile into the air. It ascends vertically almost 4000 ft before bending over gradually to an angle of 45 deg. It continues upward at this angle for about a minute until it reaches an altitude of 28 miles at a distance of 30 miles from the firing point and attains a maximum speed of 3500 mph.

Up to this point, an internal

SUPER SNOOPER: *The Snooperscope, fitted over a special helmet, was used by American soldiers in the summer of* 1944 *to enable them to see almost as well by night as by day. This device, using the infra-red ray principle, permits sighting objects clearly even on the blackest of nights.*

Easy ways

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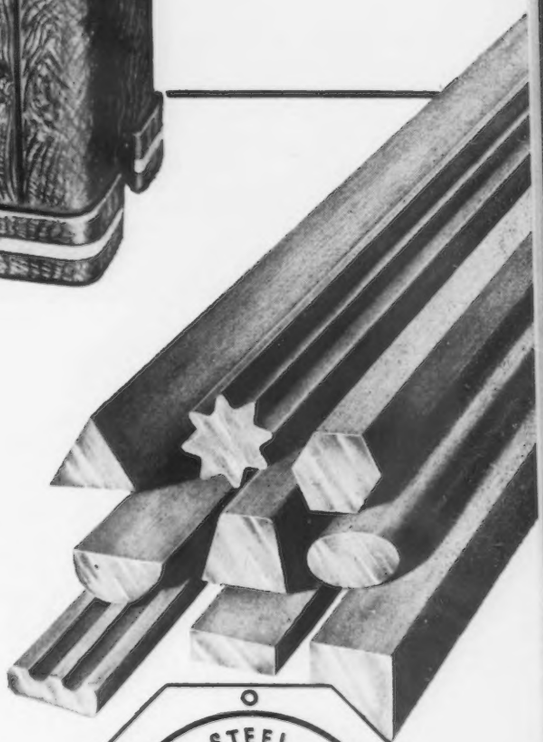

● Here is how Continental wire made to a special shape is used by a manufacturer of gas heaters. Note how it adds beauty and utility to this gas radiating heater.

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THE DIAGNOSIS... A Penola Engineer suggested the use of a soluble oil that would eliminate these difficulties and, if possible, reduce production cost.

THE PRESCRIPTION...

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with 4.5 parts of water—helped produce corrosion-free surfaces ... reduced the mist and odor so that they were not objectionable ... provided a cooler running wheel ... saved time in the preparation of the emulsion ... and reduced the soluble oil cost by one-half!

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Reg. U.S. Pat. Off.

PENOLA PRODUCTS HAVE MEANT EXTRA PROTECTION SINCE 1885

control system within the rocket, consisting of an automatic pilot, measures the velocity of the flight. When maximum velocity is attained the pilot shuts off the fuel. The rocket then continues its flight as a free projectile, following a parabolic trajectory to a height of about 100 miles in the air before it begins to fall to earth at a speed of about 1800 mph.

Civilian scientists from some of the largest industries and educational institutions are coordinating with the Navy to obtain information about the physics of the upper atmosphere.

Photographic records of a data box showing azimuth and elevation dials and a remote 2000 yd range scope will be taken at one-half second intervals. This will locate the missile within a 30-yd range and within one or two miles in azimuth and elevation.

The pilot can give command signals to the missile for up, down, right, left and fuel shut-off. From the ground, ordnance men can give a signal to the rocket for fuel shut-off in the event of misbehavior of the rocket.

Radar equipment should make it possible to follow the rocket from the takeoff until it hits the ground 80 miles away, after reaching a height of 100 miles.

The Army Air Forces, the Signal Corps and Ground Forces, will supply, operate, install and maintain the radar equipment used for long range detection and tracking. The new moon radar technique will be put into service for detecting the rocket in flight.

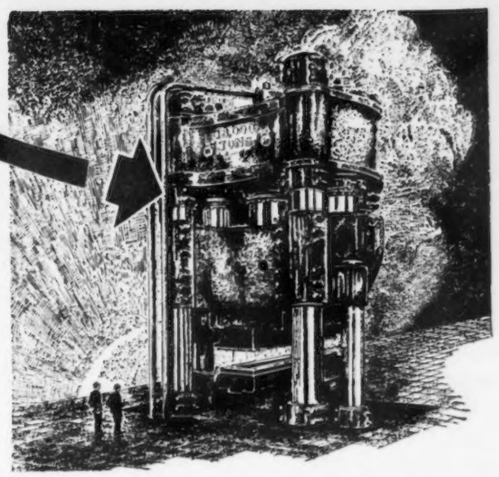
Removes Pipe Operations

McKeesport

• • • **National Tube Co.** is completing the removal of its butt-welded pipe production and will move the galvanizing dept. from its National Works operations to Lorain, Ohio. Removal of the butt-welded pipe operations was begun during the war, and completion of the move is now underway. The galvanizing shop, which has been used in recent years for special work only is reported to be obsolete and only part of the equipment will be moved. Galvanizing operations will all be centered at Lorain.

18,000 TON Die Forging Press

WILL TEAM UP with R-S FURNACES



Looming on the horizon—the largest die forging press in the world, now in process of installation at Wyman-Gordon. When this press is completed at the end of this year, magnesium and high strength aluminum alloy forgings larger than any yet made will be available. This press will be operated by Wyman-Gordon Products Corporation, a wholly owned subsidiary of Wyman-Gordon Company for the account of Reconstruction Finance Corporation which owns the press, and will be available to aircraft manufacturers in particular and to industry generally for experimentation in and for the development and production of light metal forgings. This means to our aircraft industry reduced weight which, in turn, means increased pay-load and greater performance for American planes . . . And for industry in general—complete range of magnesium and aluminum forgings.

WYMAN-GORDON
PRODUCTS CORPORATION
WORCESTER, MASSACHUSETTS, U. S. A.

R-S
QUALITY PRODUCTS SINCE 1908

General Offices: Philadelphia 44, Pa.

New York • Detroit • Pittsburgh • Chicago • Buffalo
Cincinnati • Cleveland • Houston • Washington • Los Angeles
Buenos Aires • Rio de Janeiro • Sao Paulo • Mexico City

This, the largest die forging press in the world, will make available larger magnesium and high strength aluminum alloy forgings than any yet made.

Wyman-Gordon Products Corporation selected four R-S Furnaces for the heat-treatment of work to be turned out by this mammoth press.

3 R-S Continuous Convection Type Forging Furnaces

1 R-S Covection Type Heat-Treating and Aging Furnace

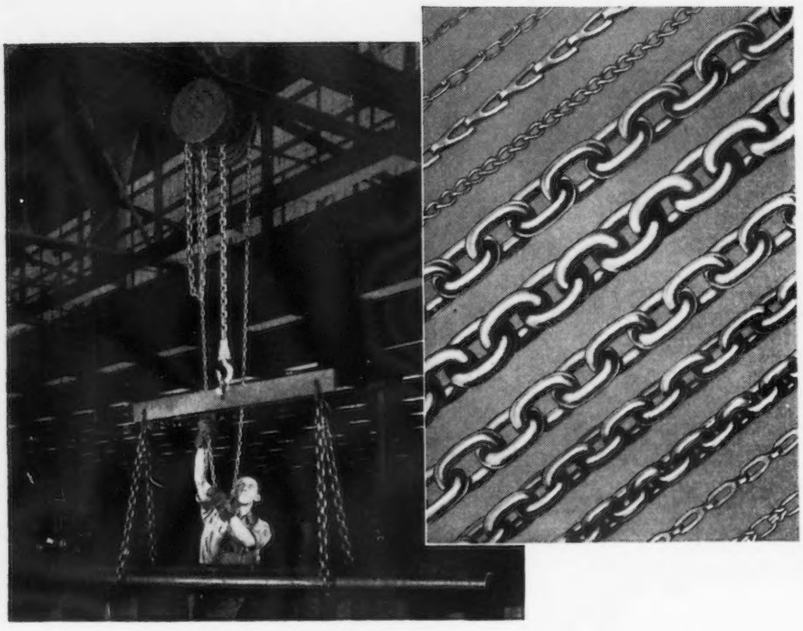
This is another instance of selection due to R-S designing ingenuity, rugged construction and dependable performance.

FURNACE DIVISION

R-S PRODUCTS CORPORATION

Manufacturing Engineers

For PRODUCTION EQUIPMENT—or the PRODUCT ITSELF



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American Chain makes practically every type and size of chain used in industry. There is often an advantage in having a single responsible source for all of your chain requirements. And you can always depend upon the high quality of American Chain products—electric welded and fire welded chain—weldless chain made of formed or stamped links—chain fittings, attachments and assemblies—repair links —cotter pins.

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Shroud of Secrecy Removed From U.S. "Bomb With A Brain"

Pittsburgh

• • • **Recently authorized** to reveal some of the details of a closely guarded war secret, Gulf Research & Development Co. reported on its development of the Azon bomb, and confirmed the success of the newer, still more effective Razon bomb, which will revolutionize future air attack.

The new missiles mean that the cry, "Bombs away" no longer ends the bombardier's job. Instead he can guide the falling explosives right down until they explode on the target.

The first development in such bombs, a 1000 pounder with a "radio brain" in its tail, was called Azon, since it could be guided for "azimuth only," that is only to right or left.

Since ordinary bombs are lost sight of long before reaching the ground, this weapon was equipped with a one million candle power flare in the tail, igniting automatically in fall. Its course can be followed clearly by eye to point of contact even from great heights and on bright days.

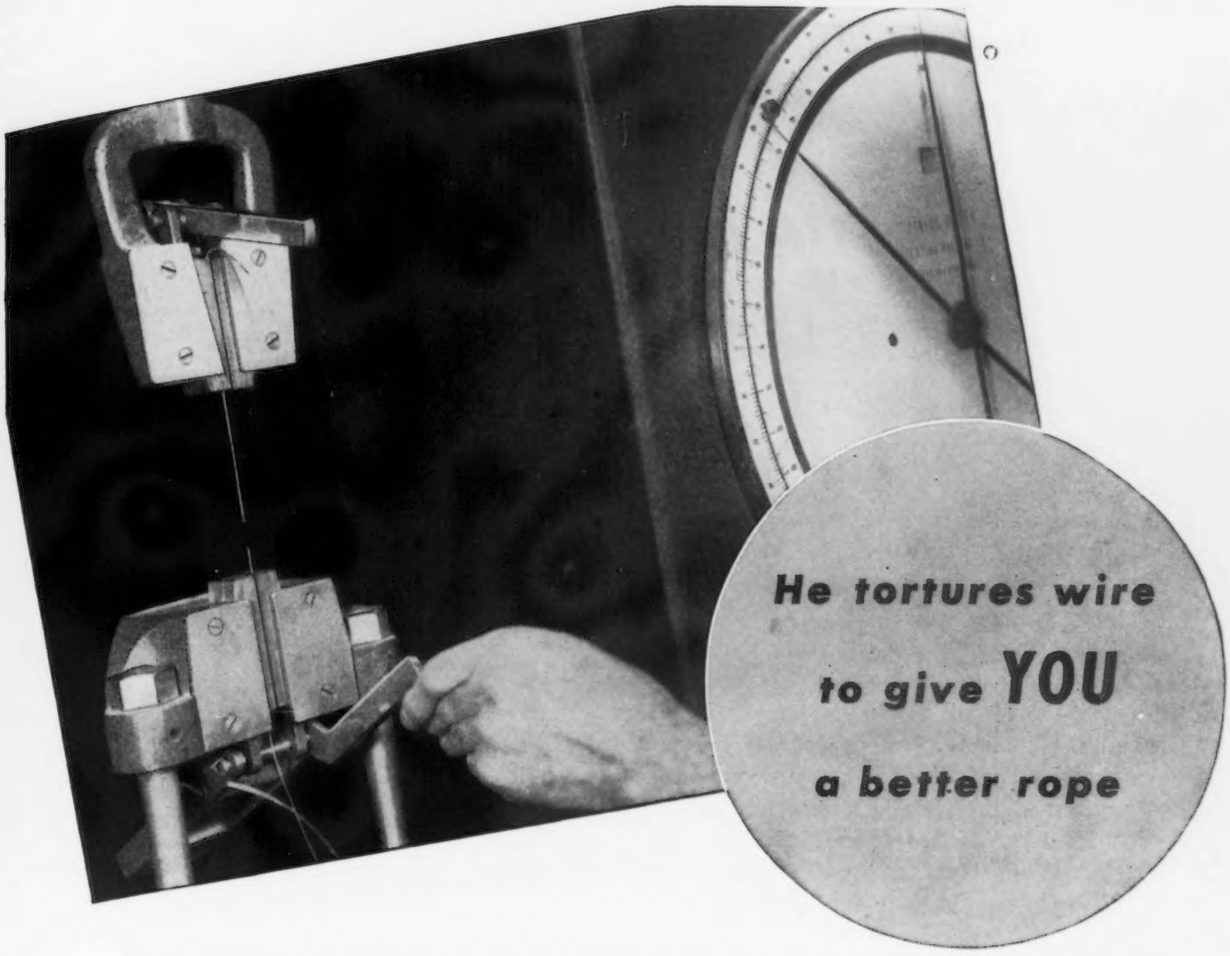
If the bomb appears to be heading wide of the target, the bombardier operates a control stick which transmits a steering signal to a radio receiver in the tail of the bomb. In response the receiver activates electrical equipment, which deflects the tail rudders; and so steers the bomb left or right.

By visual observation the bombardier can detect errors of as little as 5 to 10 ft from heights up to 15,000 ft, and correct them to left or right by pushing the bomb control stick.

If the bomb is falling true, no signal is sent and the bomb rudders remain centered.

This development was carried out by Gulf under contract from the Office of Scientific Research & Development and in cooperation with the Special Weapons Section of the Army Air Forces.

The work continued into development of the newer Razon bomb, about which details are not yet released. However, it may be stated that Razon can be corrected in its forward or backward fall,



He tortures wire to give YOU a better rope

This Macwhyte laboratory technician is working in *your* interest. He gives the strength test to samples from each end of every coil of wire we make. Each sample is stretched to the breaking point. If it passes the test, the coil is tagged OK and used for Macwhyte Wire Rope. If not up to standard, the wire is rejected.

To make sure Macwhyte Rope will give you maximum service, the finished wire is also given a torsion or twist test to check its stamina. Granular structure is analyzed by a microscopic camera. Wire samples are rotated in an arc by a special machine that checks their ability to withstand fatigue.

Strict metallurgical control is another reason you can always depend on Macwhyte Wire Rope for long, economical life.

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Macwhyte Wire Rope Catalog, G-15. 170 pages. Lists Macwhyte's full line, gives complete manufacturing story. Ask any Macwhyte representative or write Macwhyte Company.

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Monel Metal Wire Rope, Galvanized Wire Rope.

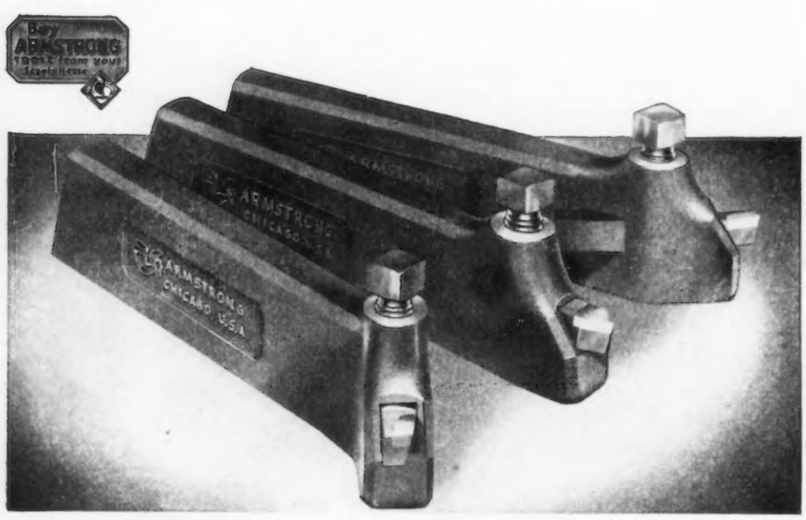
MACWHYTE COMPANY 50th Year 1896 – 1946

NO. 859

ARMSTRONG Carbide TOOL HOLDERS

ARMSTRONG Carbide TOOL HOLDERS have been specially designed and engineered for use with Carbide-tipped tool bits, and embody the special characteristics essential for the efficient use of carbide-tipped cutters, namely: great strength, extreme rigidity and close-up support for the cutting edge. The ARMSTRONG Carbide TOOL HOLDERS System makes the use of carbide tools practical for everyday operations in tool rooms, maintenance departments and machine shops. Each takes interchangeable carbide-tipped tool bits ground to different cutter shapes . . . each tipped cutter can be used in "Straight Right Hand Off-Set" or "Left Hand Off-Set Tool Holders." Hence a small investment in ARMSTRONG Carbide TOOL HOLDERS and carbide-tipped cutter bits can turn those hard-to-do machining operations into "just another routine job," changing losses into profits.

ARMSTRONG Carbide TOOL HOLDERS and Armide or other carbide-tipped cutter-bits are now available at leading industrial supply houses.



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Pacific Coast Warehouse and Sales Office: 1275 Mission St., San Francisco 3, Calif

thus realizing the objective of a missile that can be guided in all directions.

Not perfected in time for combat use, Razon represents a new weapon immeasurably increasing the potential destructive power of air attack.

An interesting problem in the development of these bombs lay in the question of whether or not bombs rotate during fall. Army opinion was divided; and research, requiring the incorporation of cameras in experimental bombs, had to be undertaken to discover that the answer is affirmative. Most bombs do spin.

Obviously the Azon bomb, to permit guidance left or right, must keep its rudders in the same vertical plane. So a special non-rotating design had to be developed.

The first combat missiles of this type were introduced to the Japs on Dec. 27, 1944, in the CBI theater. Here a surprisingly few bombers and Azon cargoes seriously crippled the enemy's Burma communications. Azon proved particularly effective in knocking out narrow and difficult bridge and rail targets, scoring hits where scores of bombs, and numerous missions, had previously failed.

Azon bombs were also used in Germany and Italy in the final days of fighting.

Meanwhile work had been pushed forward at top speed on the Razon improvement for all-around steering by control of the tendency to overshoot or fall short of the target as well as correcting for right and left errors. The success in this field has armed our nation with a weapon giving bombers sharpshooting accuracy and commensurately increasing the striking potential of U. S. air power.

To Build Gas Making Plant

Toronto

• • • **The British** Columbia Electric Railway Co., which supplies gas and electric services to the city of Vancouver, has given the contract to John Inglis Co., Ltd., Toronto, for the construction and erection of a self-contained gas making plant with a capacity of 4,500,000 cu ft a day to cost approximately $600,000. Most of the equipment will be manufactured in the local plant of John Inglis Co.

FIRST TIME EVER SHOWN!

Houghton presents "ELECTRONICS IN THE CORE ROOM"

DRY-BINDER CORES BAKED OUT IN MINUTES BY DIELECTRIC HEATING

A new principle—electronic baking of cores—will be demonstrated at the Houghton Booth, using Induction Heating Corporation's new conveyorized dielectric core oven and Hy-Ten Dry Core Binder.

This sensational new development, which will attract thousands, promises to end a bottleneck familiar to every foundry—the baking oven. While still in the experimental stage, this modern adaptation of dielectric heat to core baking may mark a great forward step in foundry practice. As an indication of the time saved, standard tensile strength cores bake out thoroughly in thirty (30) seconds. Only a thermo-setting resin-type binder will permit that speed.

This project is now in actual foundry production, where it shows early advantages of absolute control of time and temperature, uniform heating, no odor or smoke, and improved handling on a production basis.

See it for yourself at Booth 433, Fiftieth Anniversary Foundry Exposition. E. F. HOUGHTON & CO., 303 W. Lehigh Ave., Philadelphia 33, Pa.

HY-TEN CORE OILS

For today's production, Houghton offers modern, proven core oils which serve best the time-honored practice of oven-baked-and-cured cores.

These are the new "polythermic" type of oils which are given thermo-setting properties, so that cores bake through completely. Shake-out is improved, baking temperatures reduced, less smoking or gassing.

For today's production, use HY-TEN—in five types for every purpose and purse.

DON'T MISS BOOTH 433 - THERMONIC DIELECTRIC HEATING with HY-TEN DRY CORE BINDER

BAKER TRUCKS
help forge plant gain maximum production efficiency

Baker Trucks carry dies and die blocks weighing 5 tons up a 10% incline.

Remote areas in storage yard are easily accessible with Baker Trucks.

Skid loads of billets are carried right up to furnaces with Baker Trucks.

Complete mechanization of all handling operations was a major factor in bringing the output of a large forge plant to the highest level in its history. The bulk of the work is performed by a fleet of Baker Lift Trucks. Skid loads of billets and forgings ranging from 4,000 to 10,000 lbs. are transported between furnaces, hammers and trim presses on these trucks. Dies up to 10,000 lbs. are carried on skid platforms and above 10,000 lbs. on heavy-duty buggies pulled by the trucks. In this plant, Baker trucks with 5-ton loads successfully negotiate ramps with grades up to 10%. Despite the strenuous work . . . in-and-out-of-doors . . . the trucks are giving dependable service with minimum maintenance.

A Baker Material Handling Engineer can help you achieve similar efficiencies. Write for Catalog and Handbook.

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Member: Electric Industrial Truck Association

Baker INDUSTRIAL TRUCKS

Automotive Parts Assn. Elects F. C. Crawford

Detroit

• • • **Frederick C. Crawford,** president of Thompson Products, Inc., Cleveland, has been re-elected president of the Automotive & Aviation Parts Manufacturers, Inc. He was reinstalled in his place at the annual meeting of the association in Detroit, Apr. 11, attended by some 600 representatives of 410 member plants.

The association's board of directors for 1946 includes Mr Crawford, John Airey, president of King-Seeley Corp., Ann Arbor, Mich., who is vice-president; J. L. Myers, executive vice-president of Cleveland Graphite Bronze Co., Cleveland, who is secretary-treasurer; and these others: Walter F. Rockwell, president, Timken-Detroit Axle Co., Detroit; F. L. Burke, vice-president, General Motors Corp., Detroit; J. D. Eby, secretary-treasurer, Wagner Electric Corp., St. Louis; J. Y. Scott, president, Van Norman Co., Springfield, Mass.; W. A. Baker, president, Firestone Steel Products Co., Akron, Ohio; D. H. Kelly, executive vice-president, Electric Auto-Lite Co., Toledo; G. W. Kennedy, president, Kelsey - Hayes Wheel Co., Detroit; M. P. Ferguson, vice-president, Bendix Aviation Corp., South Bend, Ind.; A. W. LeFevre, vice-president, Stewart-Warner Corp., Chicago; C. I. Ochs, president, Eaton Mfg. Co., Cleveland; W. D. Robinson, president, Briggs Mfg. Co., Detroit; and G. A. Shallberg, vice-president, Borg-Warner Corp., Chicago.

Furniture Prices Up

Washington

• • • **Manufacturers of metal** commercial and institutional furniture, including lockers, partitions, shelving, cabinet work and office and store fixtures and equipment, will soon be given a price increase of 10.5 pct provided their products are made of metal.

The price increase will represent both the reconversion increase and wage-price increase due the industry and will be passed through to consumers, resulting in a price increase to consumers of about 7 pct over 1941 and early 1942 prices.

Information Free

(1) Bearing Alloys:

Booklet presents information to assist engineers and consumers of bearing alloys in the design, construction and maintenance of friction-type bearings for all kinds of machinery. Includes sections on development of bearing metals, effect of composition on bearing alloys, melting of bearing alloys, bonding of bearings, casting of bearing alloys and causes of bearing failure. *Federated Metals Div., American Smelting & Refining Co.*

(2) Towmotor Equipment:

Prospective users of lift trucks and lift truck accessories can find the right answer to many questions concerning Towmotor material handling equipment in this compact data file that is complete with appropriate information and illustrations. *Towmotor Corp.*

(3) Bulldozer Specifications:

Specifications for Caterpillar Nos. 8S and 7S straight-blade bulldozers and Nos. 8A and 7A angling-blade bulldozers give full information and dimensions of overall equipment and blade, construction details, use recommendations and weights. *Caterpillar Tractor Co.*

(4) Speed Control:

Developments in speed control are discussed in this pocket size booklet illustrated by photographs and diagrams and covering variable speed transmissions, Reeves Motodrive, Vari-Speed motor pulley and other speed control units. *Reeves Pulley Co.*

(5) Arc Welding Electrodes:

Folder gives description, application, procedure, physical properties of deposited metal, and sizes available of arc welding electrodes. *Hobart Bros. Co.*

(6) Boring and Milling:

Bulletin describes the new model 3-B Jigmil, a new basic machine for ultra precision boring and milling. This machine introduces automatic positioning and accuracy with unique push button controls. *DeVlieg Machine Co.*

(7) Cellular Rubber:

Four-page pamphlet describes various forms in which sponge rubber, bonded fibre, and other subdensity materials are manufactured. Illustrates 98 molded, die cut and fabricated shapes of flexible, elastic compressible products used for cushioning, shock absorption, vibration dampening, sealing, insulating, gasketing, etc. *Sponge Rubber Products Co.*

(8) Hydraulic Cylinders:

Description of a new line of hydraulic and air cylinders with unique mounting features and steel construction is given in this folder. The 200-lb pressure air cylinders have steel heads and caps and brass cylinder walls, and the 1500-lb pressure hydraulic cylinders have solid steel heads, caps and walls. *Miller motor Co.*

(9) Tenite Extrusion:

Nine primary operations in the fabrication of sheet plastic articles, and the equipment which may be used, are described and illustrated in a 12-page booklet "Forming Articles from Extruded Tenite Sheeting." *Tennessee Eastman Corp.*

(10) Welding Guide:

This booklet is offered as a guide in the selection of the proper type of electrode or gas welding wire to use for welding various types of materials, structure and equipment. Information is arranged in easy-to-find tabular form, indexed by industries. *Page Steel & Wire Div., American Chain & Cable Co., Inc.*

(11) Magnetic Chucks:

Eighteen-page brochure describing in detail a complete line of Hermeti-Coil Electro-Magnetic Chucks, and gives latest information on the application of magnetic chucking to a wide range of work under all conditions. Several pages are devoted to illustrations of set-ups. *Hanchett Mfg. Co.*

(12) Metal Forming Dies:

"Metal Forming Dies—Special Machinery," a booklet illustrating virtually all types of dies used in press brake work, multiple punching equipment, blanking dies, etc., and includes suggestions for the care and use of dies as well as tables of pressures. *Cyril Bath Co.*

(13) Electrodes:

Edco electrodes featuring a combination of high grade phosphor bronze welding rod with a heavy yellow shielding is described in this booklet. The protective coating causes the metal to pass through the arc steadily in the manner as do modern shielded arc steel rods. This special coating is said to provide a softer stable arc and lower spatter. *Eccles & Davies Machinery Co., Inc.*

(14) Ketos Data Sheet:

Folder contains data on Ketos, a widely used oil hardening non-deforming tool steel. Applications and physical characteristics are covered. *Crucible Steel Co. of America.*

(15) Fiberglas Cloths:

Folder describes coated Fiberglas cloths with samples of neoprene-coated and vinyl-coated fiberglas cloths, and neoprene and aluminum pigment on the cloth. *Owens-Corning Fiberglas Corp.*

(16) Crank Type Cylinders:

Bulletin, "Crank Type Cylinders," containing illustrations and performance data, and lists advantages of this cylinder and suggests many control applications. *Askania Regulator Co.*

(17) Bakelite Uses:

Profusely illustrated review discusses the importance of plastics in modern living. Contains interesting articles concerning Vinylite plastics in wearing apparel, postwar plastic products, miniature railroads and Bakelite resin-bonded plywood bringing in boatbuilding. *Bakelite Corp.*

(18) Railroad Arc Welding:

Economy of electric welding in railroad maintenance and construction discussed in bulletin GEA-4298. In the fabrication of new structures and rolling stock, it is said to save building time and material, lightens weights, and strengthens equipment. Publication contains data and illustrations of G-E electrodes and equipment. *General Electric Co.*

(19) Heat Treating Guide:

Brochure contains general facts about heat treatment of metals, including heat treatment by high frequency induction, brazing by induction heat, copper brazing in controlled hydrogen atmosphere and gives other miscellaneous data for ready reference. *Eastern Heat Treating & Brazing Corp.*

(20) Cams and Tools:

Brochure describes cams and form tools manufactured and also lists prices. Photographs show typical equipment used in the plant and types of cams and tools produced. *Stites Tool Co.*

NOTICE TO READERS: Your request for this information will be forwarded promptly to the manufacturer issuing the literature. The offer is good for only two months.

5/2/46

THE IRON AGE, New York 17, N. Y.

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INFORMATION FREE (Continued)

(21) Midget Pumps:

Complete data on various models of Eastern midget pumps and laboratory stirrers, including details of construction, alloys used, specifications and performance charts are presented in folder. *Eastern Engineering Co.*

(22) Pneumatic Chisels:

Booklet outlines and illustrates line of pneumatic chisels and chisel blanks carried by the company and features chisels with the safety retainer shank which are interchangeable with the Dallett and Chicago pneumatic hammers. *Dallett Co.*

(23) Hydraulic Presses:

Extensive information on hand operated hydraulic presses, featuring convenient location of hydraulic pump handle and containing a two speed pump, is given in booklet. Presses range from 25 to 75 tons. Also included is a description of bench type arbor presses, air operated and motor operated presses. *K. R. Wilson.*

(24) Gas Atmospheres:

New data on the preparation and application of the various types of atmospheres used in heat treating metals is given in bulletin SC-129. Nature of the constituents of the various atmospheres and the effect of each and the combinations used are described. *Surface Combustion Corp.*

(25) Power Unit for Tractors:

Catalog describes Roper-PAC, an hydraulic power unit for use on all model tractors. It is small and compact; easy to install; engineered to operate at a wide range of speeds; and can be connected and driven in a variety of ways to suit job needs. *Geo. D. Roper Corp.*

(26) Spray Guns:

Booklet describes special features of the light, medium and heavy duty spray guns, which may be converted into a compressed air dryer or suction gun, and various models of water saver guns. Prices for all types are given. *Lonn Mfg. Co.*

(27) Hydraulic Pumps:

Folder presents technical description of the hydraulic pumps in ratings of 5000 psi, along with basic requirements and advantages. Semi-diagrammatic cross-sectional sketches, typical circuit diagrams and installation sketches are also given. *Superdraulic Corp.*

(28) Precipitator:

Full details are given on the precipitator designed to remove 90 pct of air-borne dirt when installed into duct work systems of industrial air circulating and air conditioning installations. Also described is a package unit for smaller applications. *Raytheon Mfg. Co.*

(29) Rust Preventives:

Preservative lubricants and corrosion preventives compounded of Alox materials with range of applications are listed in this new pamphlet. Government specifications, descriptions and performance data are also included. *Alox Corp.*

(30) Hydraulic Pumps:

Flow-Master pumps, designed to handle light, volatile materials or heavy, viscous materials without churning or foaming, for transfering, metering or proportioning service, are described in catalog No. 25. Homogenizing pumps are also covered. Engineering data and prices are given. *Marco Co., Inc.*

(31) Welding Electrodes:

The technical information contained in this catalog and tool steel welding manual comprises complete data on metallic arc tool steel welding. Uses, metallurgical characteristics and specifications of various types of welding electrodes are given. *Welding Equipment & Supply Co.*

(32) Tool Grinder:

The Landis 12 x 28 in. universal grinder and tool grinder is described and illustrated in catalog No. K-45. Tabulation of grinding operations indicate that much ordinary tool room work can be done on the standard machine. Such applications are illustrated. Various accessories extending the usefulness of the unit are also covered. *Landis Tool Co.*

(33) Sander and Abrasive Head:

Illustrated folder describes the new Vonnegut brush-backed sander and abrasive head, especially designed for finishing irregular surfaces. Construction and operation details as well as specifications are given. *Vonnegut Moulder Corp.*

(34) Gear Sets:

Catalog 700 lists various sizes of Cone-Drive gear sets ranging from a center distance of 2 to 18 in., in ratios from 5:1 to 70:1. Drawings give dimensions for pinions, gears and spiders. *Michigan Tool Co.*

(35) Clamping Tools:

Catalog No. 44 contains descriptions and photographs of entire line of toggle-action clamps and pliers, including many new models and improvements of older models not shown in previous issues. Drawings give the measurements. *Knu-Vise, Inc.*

(36) Industrial Hose:

Featured in this booklet are the various types of air hoses, and welding, water and steam hoses, made by Hewitt. Also hoses used for fire protection in the oil industry, for drilling, and in the food industry. *Hewitt Rubber Corp.*

(37) Die Castings:

Purpose of this book is to acquaint industry with company's facilities for the production of aluminum, zinc and copper alloy die castings to specification. Illustrations cover equipment, and case studies of difficult core work and die cast threading are given. *Parker-White Metal & Machine Co.*

(38) Material Handling:

Tote box Handi-Roller, a simple inexpensive unit for moving heavy tote boxes, is described in this bulletin. Weights of two sizes of roller unit are respectively 60 and 69 lb, with a length for both units of 24⅛ in. *Rolock, Inc.*

(39) Wire Cloth and Screens:

"Perfect" wire cloths and woven wire screens made in all grades and weaves of all commercial metals and alloys are described in this catalog. The standard square openings and square meshes in general use are sold at the list prices given in catalog 32-A, with applicable quantity discounts. *Ludlow-Saylor Wire Co.*

(40) Standard Vibrators:

Catalog supplies information on E-L vibrators for power supplies. General description and ordering instructions, as well as a data table for all types of vibrators, are contained in this catalog. *Electronic Laboratories, Inc., Electronic Laboratories of Canada, Ltd.*

(41) Punching, Shearing, Bending:

Booklet contains reprints of three articles on punching, shearing and bending. Articles give production methods and illustrations show typical equipment used. *Buffalo Forge Co.*

(42) Fence Erection:

New chain link fence erection manual is designed to aid contractors, fence superintendents and others responsible for the installation and maintenance of chain link fence. Each step in described in sequence in accordance with current field practice. *Wickwire Spencer Steel Div. of Colorado Fuel & Iron Corp.*

5/2/46

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Increased Hiring In Cleveland Depends On Coal Strike Duration

Cleveland

• • • **Industrial employment** among 100 major plants representing more than half of the industrial employment in the Cleveland area increased 4.4 pct in March, the greatest employment gain here since V-J Day. according to the Cleveland Chamber of Commerce monthly survey.

In announcing the **increase** which amounted to 4204 jobs, J. W. Van denBosch, Chamber analyst, said better flow of materials and shipping releases following settlement of many of the nationwide strikes were responsible for the rising trend.

He said the March increase is over and above the number of workers who returned to work after being out because of strikes, since strike-idle employees have been considered as still on payrolls in Chamber of Commerce surveys during the last three months.

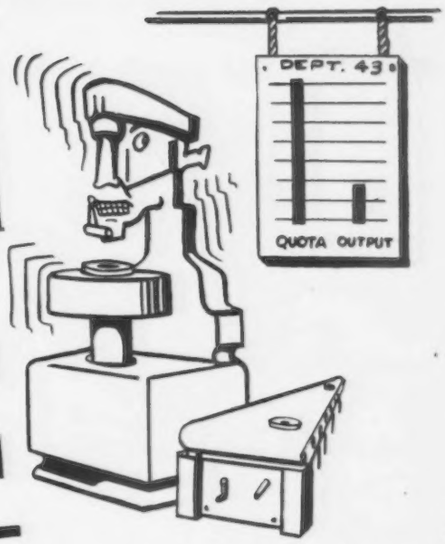
"The 4204 increase comprised gains in the plants of 59 of the 100 companies reporting to the Chamber," Mr. Van denBosch pointed out. "The 100 companies covered by the Chamber survey," he added, "represent 52 pct of industrial employment of the Cleveland area.

"At the end of February, 95,688 were on payrolls of the 100 companies, 99,892 were reported as of Mar. 27. The outlook for further gains in coming weeks is good, as 25 plants expect to add or recall employees during April, whereas only one foresees a drop in employment. Thirty-nine expect to maintain the same levels during April. A protracted coal strike would darken this outlook," he said.

"Gains were well distributed throughout the different industries, clothing and textile companies continue to expand as materials free up and competition for workers from war plants lessen. Iron and steel fabricating plants, auto parts and household appliance manufacturers were affected in greater or less degree by the more favorable raw material and shipping release situation.

"The average working week in

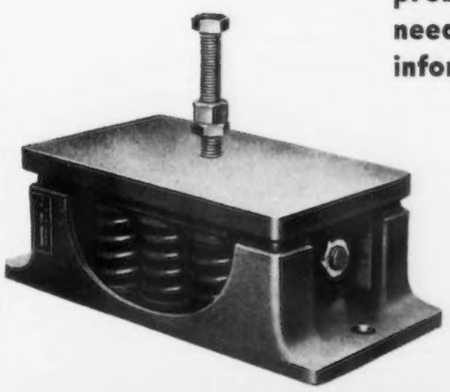
DON'T LET VIBRATION PUT A STOPPER ON PRODUCTION



Vibration represents part of the productive power of a machine escaping through the foundation on which it rests, and the result is decreased production efficiency.

Through the application of a Korfund *Engineered* Vibration Control System, the energy lost through vibration can be saved for productive uses.

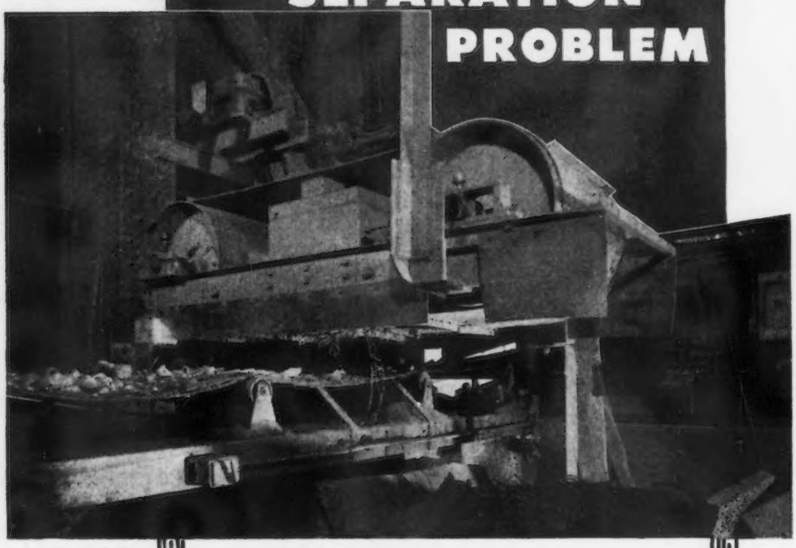
Korfund Steel Spring Isolators also save wear and tear on the machine, enable efficient production line arrangement and reduce noise and vibration within a building. Korfund Vibration Control Engineering applies the skill of years of experience in solving vibration problems to your immediate needs. Write for complete information.



Korfund Type LK Vibro-Isolator shown at left is of steel spring construction with resilient chocks at the corners to act as stabilizers. These inserts can be adjusted to the correct damping for the individual installation.

KORFUND
VIBRATION CONTROL
THE KORFUND COMPANY, Inc., 48-35 32nd PL., LONG ISLAND CITY 1, NEW YORK

How the New Dings Self-Cleaning Rectangular Magnet Solved a TOUGH SEPARATION PROBLEM



the PROBLEM Installing an effective magnetic separator in a large steel castings foundry for removal of scrap from the shakeout sand conveyor belt was difficult because of space limitations at the belt end preventing installation of a magnetic pulley, plus a large percentage of metal and a thick normal burden of material on the belt.

the SOLUTION Dings Engineers recommended installation of one of the powerful new Dings Self-Cleaning Rectangular Magnets above the conveyor. This machine provides the necessary magnetic strength to lift scrap out of the heavy burden efficiently, and gives clearance above the belt sufficient to prevent jamming even under unusually heavy load conditions. A transverse belt carries accummulated scrap off the conveyor and dumps it alongside, as shown above.

This is one example of the work in solving magnetic separation problems that Dings Engineers are doing throughout industry. And Dings "High Intensity" Magnetic Separators *stay* on the jobs that are set for them, year after year, and at costs for operation and maintenance that are negligible in even the smallest foundry's cost sheets.

Write today for full details on the complete line of Dings "High Intensity" Magnetic Separators. If yours is a special problem, Dings Engineering Service is available at no obligation to you.

Dings Magnetic Separator Co.
516 E. Smith St., Milwaukee 7, Wis.

"Magnetic Separation Headquarters Since 1899"

Dings
"HIGH INTENSITY"

March, 41.5 hrs, is down slightly as a result of a few 4-day weeks in plants rationing themselves in the use of stocks and materials.

"The nationwide wage increases are being reflected in the average labor hiring rate which was 80.3¢ per hr at the end of March, up 0.8¢ from February. This is an all-time high. The figure seems destined to go considerably higher as more local agreements are placed in force.

"At the end of February, 9908 of those reported by the 100 companies were on strike. The figure as of Mar. 27 was 7510. In March, three strikes were settled in the Chamber survey list and one begun."

Allegheny Ludlum Net And Sales Volume Off

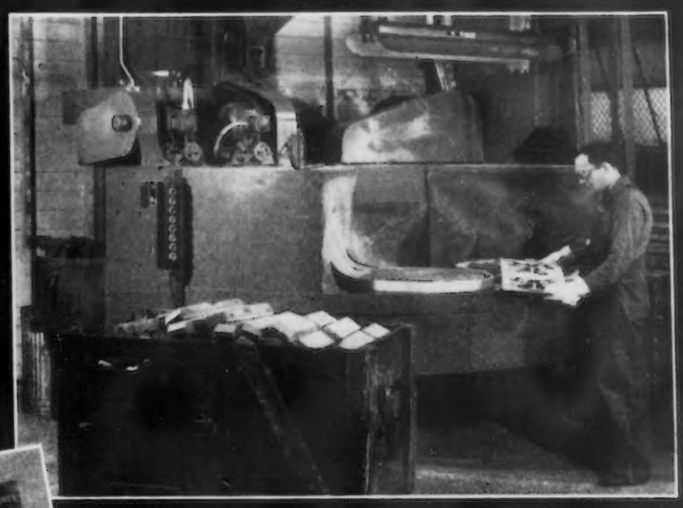
Pittsburgh

• • • **In its annual** report to stockholders, Allegheny Ludlum Steel Corp. reported net income for the year 1945 of $3,379,369 from net sales of $100,336,822. These earnings compare with $3,607,814 from net sales of $107,171,056 in 1944.

The report reviewed the company's expansion program, which includes construction of a new four high, four stand continuous cold mill for the production of flat-rolled stainless and electrical steels; enlarged facilities for the production of carbide alloys; acquisition of facilities for the manufacture of permanent magnets; and construction, when conditions permit, of a new research laboratory. The addition of permanent magnets to the list of Allegheny Ludlum products completes the firm's line of magnetic steels and places the company in a favorable position to serve the electrical and communications industries, according to H. G. Batcheller, president.

Wage, salary and pension payments amounted to $34,788,901 in 1945, equal to 34.7¢ out of each revenue dollar, as compared with $37,425,265 or 34.8¢ out of each revenue dollar in 1944. Materials and services cost $50,115,561, equal to 50.1¢ out of each sales dollar, in 1945. This compares with $52,441,670 or 48.9¢ per revenue dollar in 1944. Net working capital at the close of the year amounted to $20,979,333, as compared with $13,666,920 in 1944.

The TEST of a machine is *RESULTS*



The proof of the pudding is in the eating, so the saying goes. Surely the test of a machine is in results. The best proof of the excellent results obtained through use of the Wheelabrator is the list of case histories below. Now is the time to get set with a fast-cleaning, cost reducing Wheelabrator to meet competition on a better than equal footing. Write today for further information and data.

AIRLESS WHEELABRATORS
prove themselves on the job!

PRODUCTION UPPED 2400%

Forty brass discs, approximately 2" thick and 6" in diameter, are cleaned in five minutes in a small 20" x 27" Wheelabrator Tumblast at the Tri-Boro Brass Co., Bronx, New York. Formerly each casting required three minutes for cleaning with airblast equipment.

CLEANS BETTER AND ELIMINATES REJECTS

The Florence-Wehrle Stove Co. of Newark, Ohio, found that "The Wheelabrator cleans better, and rejects from faulty cleaning have practically been eliminated." Over a 20 month period, the Wheelabrator reduced cleaning time to 50% of that required by the airblast machines it replaced.

ONE MAN NOW DOES THE WORK OF SIX

Prior to the installation of a Wheelabrator Tumblast, the Texas Steel Co., Fort Worth, Texas, was operating its sand blast room seven days a week, twenty-four hours a day to handle cleaning room requirements. Six sand blast operators were needed. Since the Wheelabrator Tumblast has taken over, the sand blast room, using a single operator, handles only castings too large to be cleaned in the Tumblast. All other castings are Wheelabrated in eight hours' time.

CLEANING TIME CUT FROM 30 MIN. TO 6 MIN.

A Wisconsin Malleable foundry obtained these results by installing a 48" x 72" Wheelabrator Tumblast:

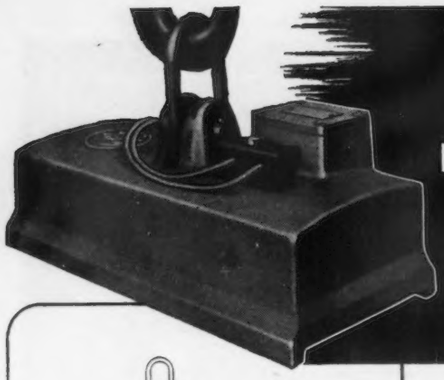
TONNAGE: The Wheelabrator handles 100% more tonnage per load than the sand blast barrel it replaced.

TIME: Wheelabrator's cleaning time averages 6 minutes per load as against 30 to 45 minutes per load with the former sand blast barrel.

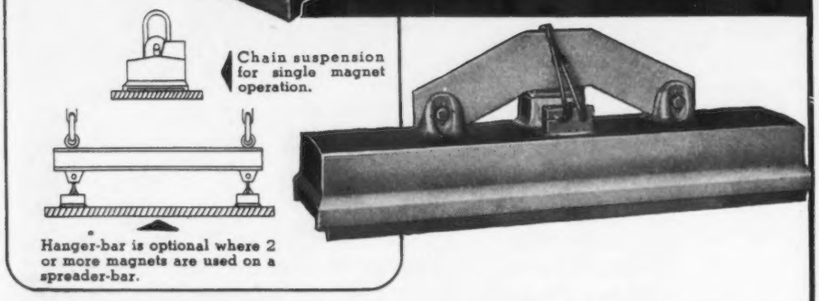
REJECTS: Whereas rejects in the cleaning department had formerly run as high as 30%, they are now completely eliminated.

American
FOUNDRY EQUIPMENT CO.
510 S. Byrkit St., Mishawaka, Indiana

WORLD'S LARGEST BUILDERS OF AIRLESS BLAST EQUIPMENT



EC&M PLATE-HANDLING MAGNETS



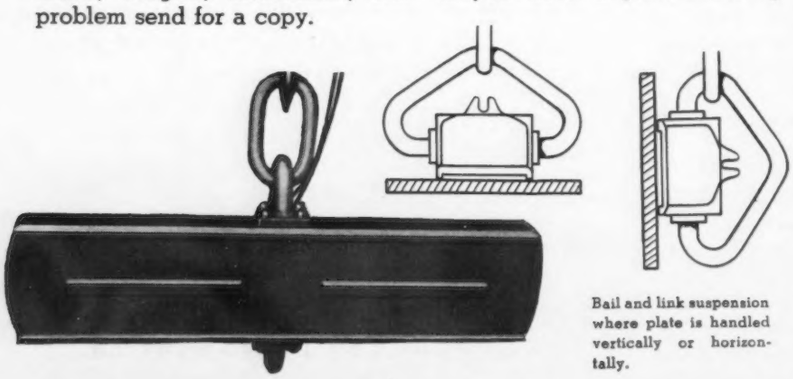
●These are EC&M Type P and Type F Magnets, designed specifically for handling sheet or plates, either cold or hot, at maximum temperature of 900 degrees or less. They can be worked singly for handling plates of medium-length. For longer plates, two or more magnets can be suspended from a spreader-bar and operated in parallel from one controller.

The advantages of these rectangular, plate-handling magnets are maximum lifting capacity with minimum magnet-weight, ability to handle material without groundmen and increased safety since prying plates apart to affix slings is eliminated.

These magnets are designed for operation on direct current power. Standard magnets have coils wound for 230 volt service. Optional windings for 115 volts and other voltages are available where required. Coils are furnished with either Class A or Class B insulation. Class B insulation is recommended for severe service and is essential for applications in which hot material is handled.

The standard controller for use with these magnets is the No. 0 Type with "Lift-Drop" Push Button Station. Where more than one plate is lifted at one time, operators quickly learn with this controller to be able to drop off plates one at a time until required number are lifted from the pile.

New Bulletin 903 gives complete information,—lifting-capacity tables, weights, dimensions, etc. If you have a plate-handling problem send for a copy.



Bail and link suspension where plate is handled vertically or horizontally.

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79th STREET • CLEVELAND 4, OHIO

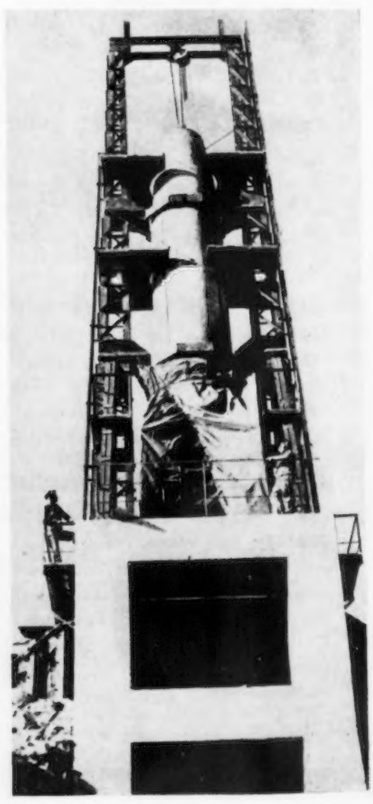
Raises Ceiling Price On Farm Machinery

Ottawa

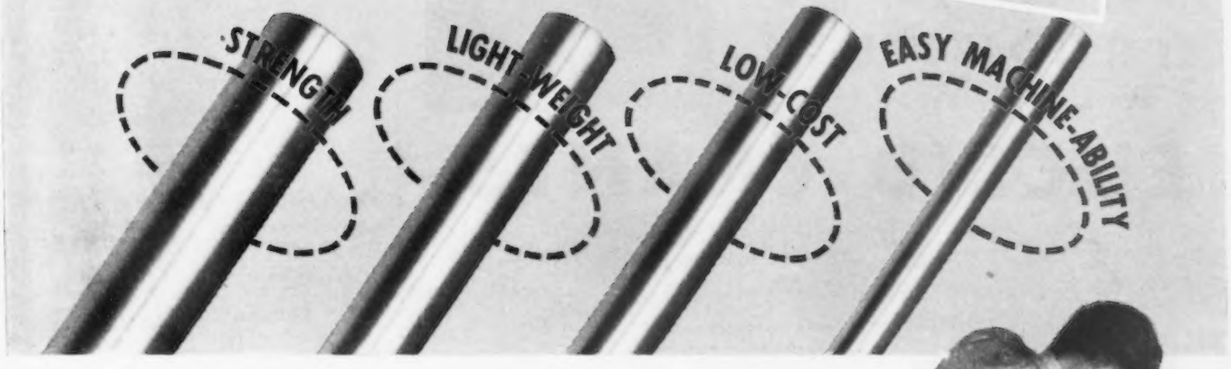
• • • **Wartime Prices** & Trade Board increased the price ceiling on Canadian-made farm machinery by 12½ pct effective as of Apr. 13. Board officials stated that a survey had shown that, with the swing over from war production, unavoidable cost increases had arisen which no longer could be met without an upward revision in the retail price.

Officials stated that companies had done their best to maintain production of the greatest possible quantity and variety of farm implements. The price increase should mean that the supply of vitally needed farm implements would be produced "to the maximum that materials and labor supplies permit." The price increase is less than half that requested by the industry. The

ALL ABOARD FOR MARS: *A close-up of the rocket launching platform and the V-2 rocket, without war head, in position for firing at the Army Ordnance proving ground at White Sands, N. Mex. The launching will take place early in May.*



DESIGN and BUILD with Mechanical Tubing for...



Specify GLOBE for Mechanical Tubing of Uniformity and Quality

GLOBE Seamless Mechanical Tubing is produced by piercing from solid billets of steel — there are no seams or welds and it offers important advantages in maximum strength with minimum weight and usually requires little machining. It is an ideal material for load bearing machine parts where strength with a minimum of weight is needed.

Its economy, compared with solid stock for the manufacture of small machine parts, is everywhere recognized. Production costs are substantially reduced because it requires little machining.

The Globe Steel Tubes Co. specializes exclusively in the manufacture of tubing. This concentration of facilities provides a dependable source of supply and assures a consistently uniform quality of product . . . Globe engineers are at your service to assist in the selection of tubing of the exact characteristics you require.

Testing and inspection of Globe Steel Tubes are regular routine. Special problems of customers are studied, too, and physical and chemical tests, spectrographic and microscopic examinations of steels are made to select the correct analysis for each customer's particular needs.

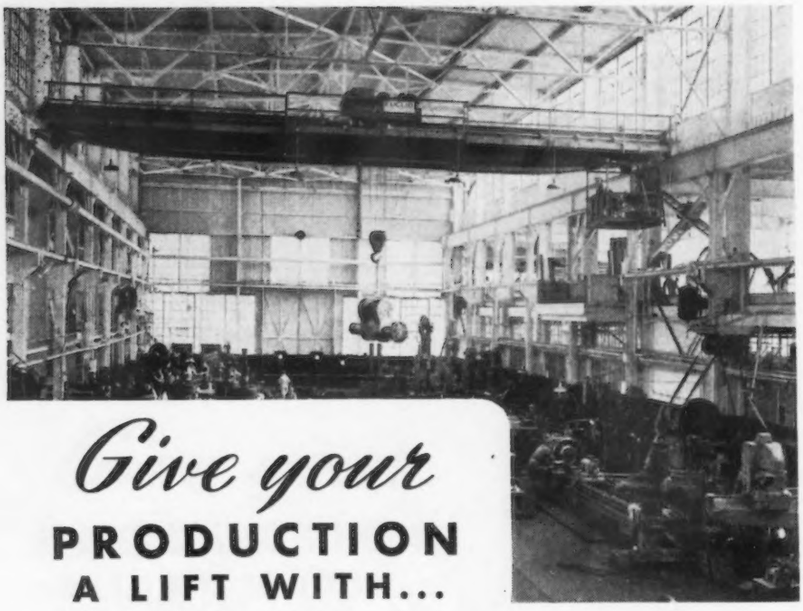
GLOBE STEEL TUBES CO., Milwaukee 4, Wis., U. S. A.

GLOBE MECHANICAL TUBING

5029

GLOBE TUBES

★ Pressure Tubes
★ Condenser & Heat Exchanger Tubes
★ Seamless Stainless Steel Tubes
★ Globeiron High Purity Iron Seamless Tubes
★ Gloweld Welded Stainless Steel Tubes
★ Mechanical Tubing



Give your
PRODUCTION A LIFT WITH...

EUCLID CRANES

EUCLID CRANES will save man-hours and expense wherever efficient handling of molds, castings, sub assemblies, finished products, etc. is essential to economical operation.

High grade, wide face, coarse pitch gearing—short, heavy shafts—and anti-friction bearings are some of the construction features assuring efficient operation—long life, low power consumption.

All units are standardized and jig-machined. This not only permits economy of manufacture and utmost value to purchasers but makes for accuracy, interchangeability and low cost maintenance.

Write for catalog describing Euclid Cranes in capacities from ½ ton to 500 tons and spans up to 100 feet.

THE EUCLID CRANE & HOIST COMPANY

1361 CHARDON RD.
EUCLID, OHIO

Board's announcement, however, stated that the new price should be competitive with prices for similar products imported from the United States, which have been free of war exchange tax and customs duties since July 1, 1944.

Following are the machines effected by the new order: Planting, seeding and fertilizing machinery; plows, tillage implements and cultivators; haying machinery; harvesting machinery; machines for preparing crops for market use; farm power machinery; farm wagons, truck and sleighs; dairy machines and equipment; spraying equipment and dusters; domestic water systems and pumps; barn and barnyard equipment and miscellaneous equipment.

WAA Devises New Plan To Speed Deliveries

Washington

• • • **The War Assets** Administration has announced that a system by which purchasers of surplus, fixed-price capital and producer goods may take delivery on the same day as their purchase is being put into effect in all WAA regions.

Designed to eliminate the time-lag between purchase and delivery, the new system is based on an inventory and sales record form, a copy of which is attached to the item for sale. The purchaser signs the form which, in conjunction with a shipping and billing form, permits immediate delivery.

Outlining the new procedure in a letter to regional directors, Frank R. C. Creedon, director of capital and producer goods disposal, said: "...the only delay in delivery would be the actual time consumed in skidding and crating the purchase." He said that the system had been tried out in several regional offices and had worked more effectively than any other plan in expediting the delivery of equipment after purchase.

It is planned to use the form on all declared and undeclared items covered by the Clayton Formula and those items where a fixed price can be established. The Clayton Formula provides for fixed prices on machine tools and certain other capital and producer goods based on their length of use.

Capital Expenditures Show Rise in '45 For Railroad Equipment

Washington

• • • **Rising to the** highest total since 1930, capital expenditures for equipment and other improvements aggregated $562,980,000 in 1945 for Class I railroads, according to the Assn. of American Railroads. This was an increase of $2,868,000 over 1944 expenditures. However, last year expenditures for equipment reflected a decrease of $13,452,000 under the previous year due to a drop of $50,083,000 in the outlay for locomotives, which was not overcome by substantial increases in expenditures for freight and passenger cars and other equipment. The overall increase was accounted for by the rise of $16,320,000 in expenditures for roadway and structures.

Expenditures for iron and steel products of all kinds amounted to $520,876,000 in 1945 compared with $526,608,000 in 1944, and for miscellaneous materials their expenditures amounted to $359,411,000 in the past year compared with $339,132,000 in 1944.

For cross-ties, the railroads expended $84,078,000 in 1945, a decrease of $14,298,000 below such expenditures in 1944.

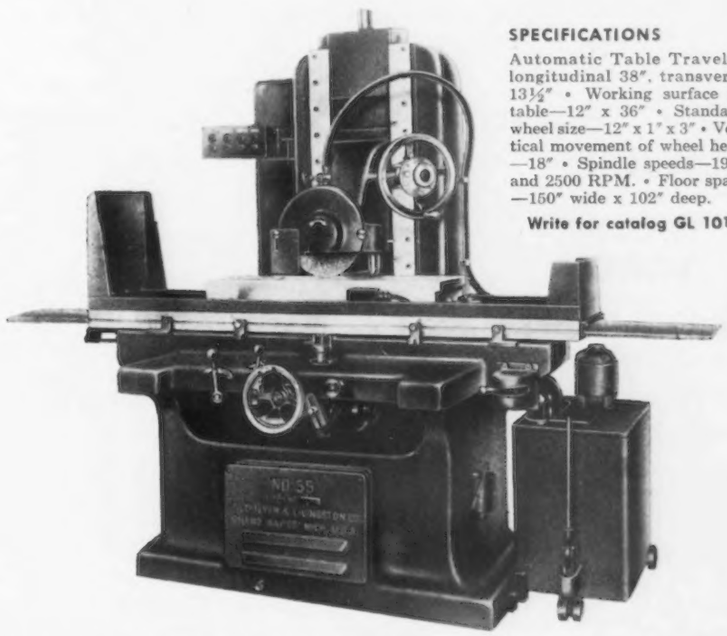
For locomotives and car castings, beams, couplers, frames and car roofs, the railroads spent $55,709,000 in 1945, compared with $66,114,000 in the preceding year. Purchases of steel rail, including new and second-hand except scrap, amounted to $77,038,000 in 1945, compared with $75,763,000 in the preceding year; and for track fastenings, track bolts, spikes, and other such materials used in connection with the laying of rails, the railroads expended $62,420,000, or an increase of $7,191,000 above the preceding year.

For wheels, axles and tires, the railroads expended $44,794,000, compared with $48,791,000 in the preceding year; and for bar iron and steel, spring steel, tool steel, unfabricated rolled shapes, wire netting and chain, boiler, firebox, tank and sheet iron and steel of all kinds, their expenditures amounted to $30,960,000 compared with $36,044,000 in the preceding year. Purchases of interlocking and signal material in 1945 amounted to $28,880,000.

FASTER PRECISION PRODUCTION

125 feet per minute longitudinal table speed with G&L's GRAND RAPIDS No. 55 Surface Grinder

Only GRAND RAPIDS Hydraulic Feed Surface Grinders provide such exceptional table speed. Both the longitudinal table travel and the cross feed are automatic, hydraulically actuated. The wheel head is powered for rapid vertical travel. Automatic and powered movements of the Grand Rapids 55 cut the operator's efforts to a minimum. Magnetic chucks are available.



SPECIFICATIONS

Automatic Table Travel—longitudinal 38", transverse 13½" • Working surface of table—12" x 36" • Standard wheel size—12" x 1" x 3" • Vertical movement of wheel head—18" • Spindle speeds—1925 and 2500 RPM. • Floor space—150" wide x 102" deep.

Write for catalog GL 101

The Grand Rapids No. 55 Surface Grinder combines ALL these advantages:

- ★ Longitudinal table speed of 125 feet per minute.
- ★ Integral cast column and base assures permanent alignment of vertical head ways and cross saddle ways.
- ★ Starters, controls and motors easily accessible.
- ★ Two spindle speeds, reduce wheel costs.
- ★ Patented vertical movement of wheel head.
- ★ Bijur one-shot lubrication system.
- ★ Special G & L spindle motor end-bells and over-size precision ball bearings.
- ★ Vickers vane type hydraulic pump.
- ★ Portable, self-contained motor-driven coolant system.

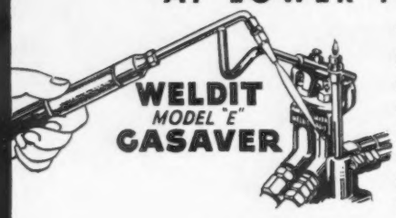
GRAND RAPIDS
GALLMEYER & LIVINGSTON CO.
GRAND RAPIDS, MICHIGAN, U.S.A.

What "GRAND RAPIDS" Quality Means: G & L cast their own close-grained gray iron, machine all parts to micrometric tolerances, and precision-assemble grinding machinery of unsurpassed performance. *Grand Rapids* means *top* quality in Hydraulic Feed Surface Grinders.

GALLMEYER & LIVINGSTON COMPANY
200 STRAIGHT STREET, S. W., GRAND RAPIDS 4, MICHIGAN

Safe Welding

AT LOWER PRODUCTION COSTS



The Weldit Gasaver shuts off the welding flame when not in use. . . . Conserves essential materials by cutting oxygen and acetylene consumption as much as *fifty* per cent. Prevents injury to workmen—or sudden fires—from dangerous idle torch flames. . . . Adjustment remains unaltered between welds.

When the Weldit Gasaver has been installed, you simply hang idle torch on the handy lever rod. Weight of torch pulls rod down, thus automatically shutting off supply lines. Relight instantly by passing torch over Gasaver pilot light. No bother. . . . No time lost. . . . *No readjusting required.* . . . Price $10.00 at Detroit. Order today.

Better Soldering, Annealing and Heating Jobs

WELDIT
MODEL "CW"
BLOW TORCH

The Weldit Model CW Blowpipe is in daily use by many foremost industrial plants. . . . Built in accordance with the recommendations of leading fabricators of sheet metal products. . . . Operates on either natural gas, manufactured gas, or other low temperature fuel gas and compressed air. Stands up under rough shop use. . . . Send for literature.

WELDIT INC.
641 BAGLEY AVENUE • DETROIT 26, MICH.

No Layout needed!

. . for punching, slotting and notching of plates

One-man Operation; Positive Control; Quick, Accurate Positioning

Where runs are too short to justify the use of a spacing table, or where irregular plates must be handled, this modern Thomas Duplicator is ideally adapted. It affords rapid, precision duplication of holes, notches or slots, and will speed production in car-shops, bus and truck building plants and in numerous other fabricating operations in varied industries.

Write for Bulletin 312

THOMAS
MACHINE MANUFACTURING COMPANY
PITTSBURGH 25, PA.

WAA Announces Lease Of Plants to Kaiser, Reynolds and Others

Washington

• • • **Disposal** of government-owned aluminum facilities have been substantially completed with announcement by WAA of the lease of the Baton Rouge Alumina plant to Kaiser Cargo, Inc., and the Troutdale reduction plant to Reynolds Metals Co. Two government-owned alumina plants, the three reduction plants capable of economic operation, the three sheet mills, and two of the four extrusion plants have now been committed.

Other war plants recently leased or sold for private operation include:

Royal Typewriter bomb parts plant at Hartford, Conn., sold to the Hartford-Empire Co. for expansion of its glass-making machinery output.

American Type Founders gun mount plant at Newark, sold to Cords, Ltd. Inc. for production of molded electrical cords.

Tung-Sol Lamp Works electronic and radio tube plant at Newark, leased to Tung-Sol for manufacture of electric lamps and radio tubes.

Additional facilities of the Ozark Chemical Co. plant at Tulsa, leased to that firm to bring production capacity for sulphuric acid from 200 to 320 tons a day.

An Indianapolis dry cell battery plant sold to P. R. Mallory & Co. for manufacture of batteries and automotive products.

Tennessee Products Corp. plant at Chattanooga, sold to the company for continued production of coke and by-products.

The Timken bearing ring plant at Newton Falls, Ohio, sold to Standard Steel Spring Company for production of automobile bumpers.

The Rheem Mfg. Co. fuselage assembly plant at South Gate, Calif., sold to the firm for production of electric motors, thermostats, etc.

The Firestone heavy duty tire and tube plant at Des Moines, sold to the firm for production of tractor and earth-mover tires.

Canadian Pig Iron Output Seen Steady

Toronto

• • • **While pig iron production** in Canada registered a minor loss for the month of February the decrease was entirely due to the shorter month. In February pig iron output amounted to 143,171 net tons or a daily average rate of 67.3 pct and compares with 143,685 tons in January when the daily average was 61 pct of total rated capacity; output in February 1945 was 149,487 net tons.

In the month under review production included 119,520 tons of basic iron of which 2333 tons were for sale and the balance for further use of producing companies; 14,567 of foundry iron, all for sale, and 9084 tons of malleable iron all for sale.

For the first two months of this year pig iron production totaled 286,856 net tons compared with 305,456 tons in 1945 and 274,006 tons in 1944.

Blast furnace charges in February included 262,292 tons of iron ore, 17,145 tons of mill cinder,

CALLING ALL KIDS: *This midget "Handie-Talkie" radio station is capable of sending and receiving messages up to two miles, according to its builder, Charles T. Haist, Jr., who sees its use by surveyors, mothers keeping in touch with their children, doctors, taxi and bus drivers, farmers and others who must keep in touch with the office or the home. The device weighs* 1½ *lb.*

PRODUCTION GOING UP!

WITH OSGOOD MOBILCRANES ON THE JOB!

Materials handling, one of the most important factors in production, is the key to increased production and lower costs. A designed-to-the-job **OSGOOD MOBILCRANE** that's compact and maneuverable can lift, move and place the heaviest of materials quickly, efficiently, economically . . . assuring maximum output from both men and machines.

One man operation through simple, positive-acting controls means fast, precise and safe operation. One-engine powered for greater economy and minimum maintenance. The **MOBILCRANE** requires no special roadbed or driveway . . . it's designed for easy, speedy maneuvering even in the closest quarters.

See your **OSGOOD** distributor today, or write for complete details . . . learn how and why an **OSGOOD MOBILCRANE** can save time, money and manpower by providing efficient handling of heavy materials.

THE GENERAL EXCAVATOR COMPANY CRANES, DRAGLINES AND SHOVELS DIESEL, GAS, ELECTRIC

Associated with The General Excavator Company

OSGOOD

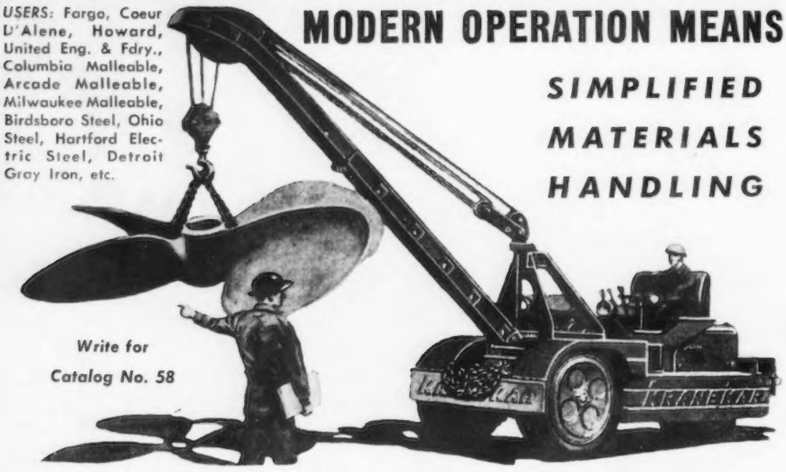
THE OSGOOD COMPANY • MARION, OHIO

OSGOOD SHOVELS, DRAGLINES CRANES CRAWLER & WHEEL MOUNTS DIESEL, OIL, GAS, ELECTRIC

USERS: Fargo, Coeur D'Alene, Howard, United Eng. & Fdry., Columbia Malleable, Arcade Malleable, Milwaukee Malleable, Birdsboro Steel, Ohio Steel, Hartford Electric Steel, Detroit Gray Iron, etc.

MODERN OPERATION MEANS

SIMPLIFIED MATERIALS HANDLING



Write for Catalog No. 58

KRANE KAR cuts handling time! *It lifts, it transports, it spots the loads*—loads of any shape or size up to 10 tons, using hook or magnet. Efficiently handles castings, patterns, flasks, cores, molds, ingots, scrap, sand boxes . . . and, with buckets, handles sand and clay. Rubber-tired, **KRANE KAR** operates *indoors* or *outdoors*. Loads and unloads trucks and freight cars. In repair operations, **KRANE KAR** moves foundry equipment to and from repair stations, spotting them for repair and installation. Our materials-handling expert will be glad to help you

THE ORIGINAL SWING BOOM MOBILE CRANE WITH FRONT-WHEEL DRIVE AND REAR-WHEEL STEER

2½, 5, AND 10 TON CAPACITIES

KRANE KAR

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SILENT HOIST & CRANE CO., 851 63rd ST., B'KLYN 20, N.Y.

OHIO SHEARS

SPECIAL STEEL
UNIFORM HARDNESS
ACCURATELY GROUND

O. K. SOLID STEEL SHEAR BLADES for maximum toughness and keen edge holding qualities. Recommended for heavy plate work. Made in 3 grades suitable for all jobs: O. K. BATTLE AXE for shearing up to and including ¼ in. mild steel or equivalent, O. K. DURA-CROME for shearing hot or cold plate steel up to 1¼ in. or equivalent, O. K. STANDARD for average runs and heavy plate shearing.

GANG SLITTERS are made to the same quality and specifications as O. K. SOLID STEEL SHEAR BLADES. Precision ground to ± .0002 tolerances on thickness, diameter, and bore—extremely high finish.

The* OHIO KNIFE *Co.

CINCINNATI 23, OHIO, U.S.A.

scale, sinter, etc., and 4368 tons of scrap iron and steel. During the month two blast furnaces were banked and one blown in, leaving eight stacks in blast, two banked, and four blown out at the end of February.

Output of ferroalloys in February amounted to 10,872 net tons compared with 10,878 tons in the previous month and with 13,402 tons in February 1945. During the month the following alloys were produced: ferrosilicon, silicomanganese, ferromanganese, ferrochrome, chrome-x and ferrophosphorus. In the first two months of this year production of ferroalloys totaled 21,750 tons compared with 25,532 tons in 1945, and 31,215 tons in 1944.

Battery Maker Builds Research Laboratory

Depew, N. Y.

• • • **A modern** battery laboratory has been opened by the National Battery Co. with research activities under the direction of Dr. Eugene Willihnganz, formerly with the National Lead Co.

The laboratory is largely devoted to the building and testing of experimental batteries. Batteries can be charged and discharged at any desired rates and various types of life tests can be set up on automatic timers. Equipment is provided for measuring physical strength of grid metal and hard rubber, and provision is also made for testing large batteries at charge rates up to 3000 amp and discharge rates of 10,000 amp. Equipment is being installed for automatic grid casting, machine pasting, assembling and forming all types of batteries.

An X ray diffraction unit is the first of its type to be installed in a battery research laboratory. It will be used to measure the distances between atoms in any substance being investigated. This interatomic distance is a guide to the chemical substance present. This property is extremely important to the battery industry since it can be used to study battery pastes to learn which substances are present and how they change during mixing and drying.

A spectroscope is also part of the laboratory equipment and will be used to detect and measure minute

measures of foreign metals in battery alloys. It is an excellent method of checking the purity of pig lead, grid metal and battery oxides. When trouble is experienced with batteries and a foreign metal is suspected as causing the trouble, the spectroscope offers a quick, reliable method of locating the offender.

New Officers Elected By Electrochemists

Birmingham

• • • **Dr. W. C. Moore,** U. S. Industrial Alcohol Co., Stamford, Conn., was elected president of the Electrochemical Society, Inc., at a semi-annual meeting of the society held here Apr. 11-13. Dr. Moore succeeds W. R. Veazey, Midland, Mich.

Dr. A. L. Ferguson, University of Michigan, was elected vice-president; W. W. Winship, Thermal Syndicate, New York, was reelected treasurer, and Dr. C. G. Fink, Columbia University, was reelected secretary.

An award of $100 was made to Dr. Austin Eugene Hardy, Lancaster, Pa., for his paper on "Photoconductivity of Zinc-Cadmium Sulfide," and an award of $50 went to Dr. James T. Waber, Illinois Institue of Technology, for his paper on "Stress Corrosion Cracking of Steel."

In delivering the Joseph W. Richards Memorial Address, Dr. Stewart J. Lloyd, head of the University of Alabama's chemistry dept., asserted there were three menaces to the free unregimented study "of our material world." He named them as Marxist ideology and orthodoxy, military censorship and secrecy, and the application of a moratorium to all scientific research.

Dr. Lloyd cited the atom bomb as a serious threat to the freedom of scientific research, charging that "this time we cannot blame Marxist ideology, but rather the usual military effort to enforce secrecy and censorship on everything it touches."

"If we are to continue to produce revolutionary basic fundamental discoveries such as radio-activity, the quantum theory, radar, etc., we must leave our first rank researchers to wander as they will among the fields that beckon to them," he said.

SEMISILICA BRICKS

DURATION OF HEAT AFFECTS REFRACTORIES

Following statements are based on temperature range from 2200° F to 2700° F.

SHORT DURATIONS OF HEAT

Furnaces with daily or shorter firing cycles usually require a good clay or super duty brick.

MODERATE DURATIONS OF HEAT

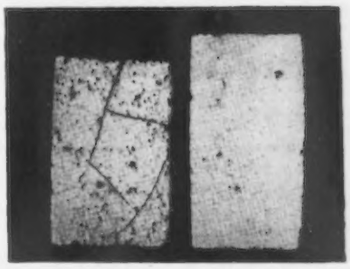
Furnaces with firing cycles of days, weeks or months require refractories which will not vitrify, shrink or spall, from the prolonged heats.

RM SEMISILICA BRICKS are made for this service. The picture at the right shows the results of 24 hours at 2650° F. on a First Quality Clay Brick and the almost unaffected RM.

LONG DURATIONS OF HEAT

Furnaces, intended to be run continuously can safely be lined with RM SEMISILICA BRICKS, provided the face temperature of the lining is below 2700° F. While silica bricks are ideal for continuous heats, a furnace may have to be shut down, which is hard on Silica Bricks, but RM SEMISILICA BRICKS take it easily.

Note. Some slags and gases attack refractories, so if in doubt, please ask or write for recommendation for your furnaces.



Compression, vitrification and spalling of First Quality Clay Brick, and relatively unaffected RM Semisilica brick after a run of 24 hours under heat and load.

In STEEL MILLS:

For Heating, Reheating, Annealing and Heat Treating Furnaces, OH Regenerators, Blast Furnace Stoves, Soaking Pits, etc. In the roofs, where spalling failure is most prevalent, they perform their greatest service.

In MANY INDUSTRIES:

Such as Chemical, Ceramic, Zinc Smelting and other industries where continuous heats in the temperature range of RM's are required for their processes.

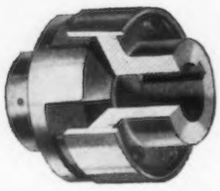
RICHARD C. REMMEY SON CO.

PHILADELPHIA 37, PA.

REMMEY

L-R FLEXIBLE COUPLINGS

Prolong Life of Old Machinery-*Safeguard* New Equipment



L-R Type "C" Steel Collar Extension gives smooth all-over surface with accessibility and added protection. *Quiet.* Pat. and Pats. Pend.

L-R Flexible Couplings play a large part in conservation of hard-to-replace machinery and in the protection of new machinery.

With simplest construction, L-R Couplings most efficiently take up and correct misalignment, shock, vibration, etc. Free-floating load cushions hung between metal jaws adjust instantly to every emergency. NO SHUT DOWNS FOR CHANGING. CUSHIONS ALWAYS IN SIGHT.

Send for Complete L-R Catalog and Selector Charts to help you find quickly, couplings engineered to your needs. For every duty. 1/6 to 2500 H.P. Wire or write

LOVEJOY FLEXIBLE COUPLING CO.
5066 WEST LAKE ST. CHICAGO 44, ILL.

CHILLED SHOT DIAMOND GRIT

Airless or centrifugal operating machines require Heat-Treated Shot or Heat-Treated Steel Grit.

The ordinary Shot and Grit will not do. They break down too fast and wear away quickly. In other words—expensive at any price.

Our Shot and Grit were made expressly for use in airless machines.

It simply means—
More cleaning at much less cost.
More cleaning and less dust at less cost.

And, remember—any old size won't do.

There is a correct size of Shot and Grit to obtain maximum results.

If cleaning grey iron, malleable iron, or steel drop forgings, we can save you money.

Let us prove it!

HARRISON ABRASIVE CORPORATION
Manchester, New Hampshire

Florida Seeks To Develop Valuable Mineral Deposits

Lake Wales, Fla.

• • • **Florida is considered** an agricultural and tourist state, and not generally as a mining state. Yet in 1941, Florida produced one-fifth of a billion dollars' worth of mineral products, according to Fred E. Kunkel.

The state has long been known for its production of phosphate, standing first in the nation, with a volume three times that of Tennessee, the second ranking state. But that Florida has four metallic minerals in both commercial quantity and quailty is not so well known.

These minerals are ilmenite, rutile, zircon and monazite, found in Florida's beach sands. Before the war the first three minerals were shipped in principally from India and Australia. During the war, manufacturers turned to Florida and during the summer of 1944 alone 2000 tons of ilmenite and 300 tons of rutile were being mined monthly in Florida. This volume doubled in 1945. Florida is a large limerock producer. It also produces coquina, fuller's earth, kaolin, clay sand and gravel.

With the three minerals already mentioned (rutile, ilmenite and zircon) available in large tonnage for industrial use and development, these natural resources plus advantages of strategic location to Latin American markets, now recommend Florida as a state of industrial opportunity. For example, electrical insulator and resistance manufacturers who use large amounts of zirconium in ceramic products—lolocated in Florida, will be close to the South American market.

The beaches of Florida are rich in deposits of high grade ilmenite, zircon and rutile. In some sections these minerals have been mined since 1916. More recently large additional deposits have been discovered, opening the way for greater expansion.

Manufacturers who use these minerals may wish to locate in the geographic center of the state, in the vicinity of Lake Wales, so that finished products could be sent di-

rect to the markets in Florida, cultivating those markets extensively at low cost sales expense.

The second mineral mentioned, rutile, is used as a flux in welding rod coatings and in steel. It is nonmagnetic and has fair electrical conductivity. Ilmenite and rutile yield titanium by extraction and are combined in a base or used as an oxide. Their greatest use is as a pigment for white and yellow color in paint, face powder, rubber, rayon, paper and leather.

Zircon is a replacement for tin and antimony oxide opacifier in vitrified enamels. Zirconium is also used in ceramics, while metallic zirconium is employed in photoflash bulbs, radio tubes and for scores of other purposes. Zircon is one of the most common and widespread minerals in Florida sands. The above mentioned mineral products are also used in special alloys, abrasives, optical glass, cutting tools, aeroplane motor spark plugs and electrical resistance units.

Florida is in the process of awakening to the industrial possibilities of the mining industries. Industrialists within the state seek to build in Florida a diversified industrial network, the output of which would be limited only by the consuming power of the marketing area.

Metal Bed Price Up

Washington

• • • **Manufacturers' prices** for metal beds, cots and bed springs —first of the consumer goods ceilings to reflect the steel price increase, according to OPA—will go up from 15¢ to 30¢ per unit, that agency announces.

In the action covering cots and bunks, effective Apr. 20, the agency will authorize manufacturer increases in the dollar-and-cent amount of steel cost increases since 1942 but will require absorption at wholesale and retail. The action covering metal beds and spring will be effective Apr. 22.

The increases amount to about ½¢ per lb of steel used, the price agency said and compensates for previous steel price increases. The new prices will be stated in dollars and cents for manufacturers and retailers; wholesalers will be provided with a formula.

FOR BUILT-IN APPLICATIONS OR SEPARATE BLOWERS, YOU'LL GET RESULTS WITH R-C *dual-ability*

Typical application of a built-in R-C Rotary Positive Blower to a small oil-fired shop forge.

The combination of maintained air volume and long-time dependability accounts for the wide success of Roots-Connersville Rotary Positive Blowers in combustion processes, such as supplying air, boosting gas pressures and mixing air with oil. The simple rotary design provides positive delivery of air or gas at the required pressure. Sturdy, accurate construction, with no small moving parts, assures years of trouble-free operation.

Equally sound designs of R-C Centrifugal Blowers afford similar long-time satifaction. Our *dual-ability* to provide either type insures unbiased recommendations. Consult us without obligation.

CENTRIFUGAL

Where centrifugal blowers are of advantage, R-C modern design single or multi-stage units deliver fine performance.

ROOTS-CONNERSVILLE BLOWER CORPORATION

One of the Dresser Industries

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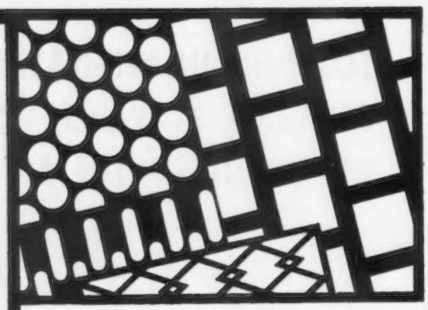
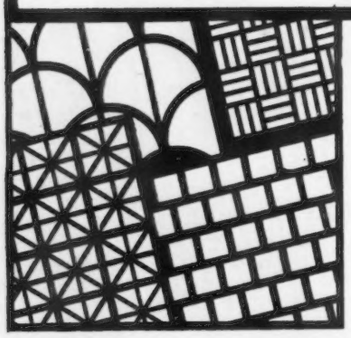
BLOWERS FOR EVERY NEED

ROTARY POSITIVE AND CENTRIFUGAL BLOWERS • EXHAUSTERS • BOOSTERS
LIQUID AND VACUUM PUMPS • METERS • INERT GAS GENERATORS

PERFORATED METALS

for every industrial use





Hendrick offers a complete line of perforated metals for every type of application, in all commercially rolled metals, any gauge or size of opening. More than 70 years experience in perforating metals, extensive plant facilities and large stock of dies and tools assure outstanding performance and long service life. May we quote you?

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Sales Offices In Principal Cities

Perforated Metals
Perforated Metal Screens
Architectural Grilles
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METALLOGRAPHIC DEPARTMENTS

in the commercial field in the Middle West

operated in conjunction with our advisory and consulting service on

- Metallurgy
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Two laboratories, Buffalo and Chicago, offer you prompt and accurate service on photomicrographs, physical testing and chemical analysis on ferrous and non-ferrous materials, sand, coal, coke, fluxes, oils, and other metallurgical materials.

Service to Foundrymen since 1903

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Metallurgists – Chemists – Foundry Engineers

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British Are Developing 5-Yr Plan for India Costing $2700 Million

London

• • • **The total cost** of the provincial plans for a 5-yr development period in India will amount to $2700 million, and the sum allocated to industry (to the extent to which it is financed by the government) is $66 million. A scientific research expansion plan has been evolved, and laboratories planned are the National Chemical Laboratory at Poona, National Physical Laboratory at Delhi, National Metallurgical Laboratory at Jamshedpur, and Fuel Research Station near Dhanbad.

These facts are revealed in a review of the progress of public utility and industrial undertakings in India, resulting from 18 month's work by Sir Ardeshir Dalal, Member for Planning and Development of the Governor General's Executive Council. Programs of development include railways, civil aviation, national highways, posts and telegraphs, information and broadcasting. To counteract deflation and unemployment during the transition period, the provincial governments have been asked to submit urgent interim items from their 5-yr plans and these will be coordinated into the all-India program.

In April 1945 a statement was issued of the objectives of the in-industrial policy of the Government of India, describing the place of the State in industrial development, the need for planned industrial progress, and the necessity for controlling industry in the public interest. At the present time aspects of industrial policy are being considered in consultation with the Provinces and the Indian States, and when these are concluded it is proposed to proceed with legislation for central control of certain industries of national importance and the establishment of licensing and investment boards. Last year industrial panels were established to make recommendations for a detailed plan for 5 yr as the first stage of a 15-yr plan of industrial development.

The planning department has encouraged private enterprise to carry out its own plans provided

they do not seriously conflict with the ultimate plan of industrial development to be laid down in consultation with Provinces and States, and to ensure that there is no uncoordinated development, capital issues and capital goods licensing machinery are available. The possibility of utilizing the surplus machinery and equipment available in the well-equipped ordnance factories is being examined, and some of the factories have already been turned over to civilian production.

A-L Steel Broadens Insurance Program

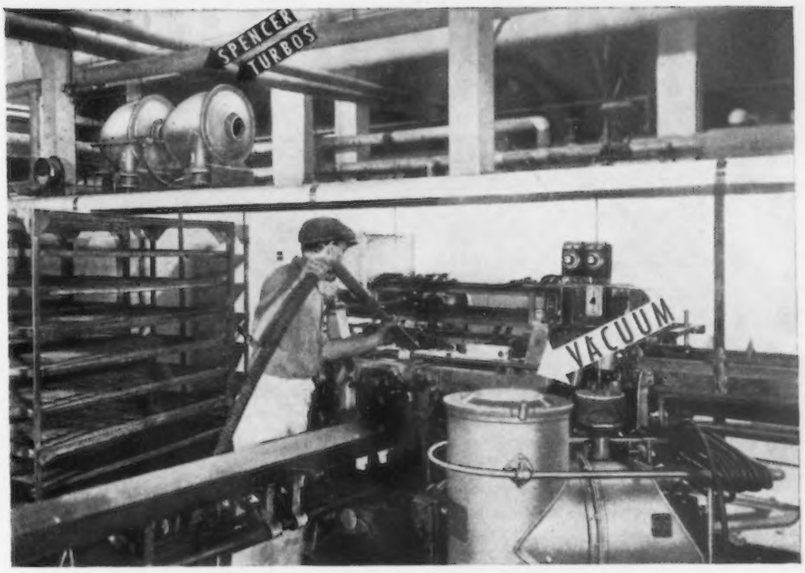
Pittsburgh

• • • **Allegheny Ludlum** Steel Corp. announced that it has made arrangements to revise and expand the scope of its group insurance program to provide greater protection, at minimum cost, for its employees and their families. The new plan will broaden the existing program, which is limited to life insurance on the employee, to provide hospitalization and other protection not now available to employees and their dependents.

Benefits under the new plan will include insurance on the life of the employee, weekly sickness and accident benefits, insurance for death or dismemberment by accidental means, personal hospital expense and surgical operation insurance, and hospital expense insurance for members of the employees' families. The revised program will become effective when 75 pct of the employees have enrolled.

"We are happy to make this additional insurance protection available to our employees," said H. G. Batcheller, president. "It is our hope that everyone will take advantage of the opportunity and enroll promptly so that the program can be put into effect as soon as possible."

Under a contract with the Metropolitan Life Insurance Co., Allegheny Ludlum will share the cost of the insurance and administer the program, as it has been doing under the present plan. Thus the cost to employees is less than would be the case if comparable protection were obtained on the open market, it was explained.



PRESSURE AND VACUUM
in a Bakery . . . BOTH ARE SPENCER

Thanks to Spencer Vacuum Cleaning systems, compressed air is seldom used for cleaning today in modern plants. Portable machines are easily moved to clean floors, walls, machinery and even the product being manufactured. Spencer portables are available in sizes up to 7½ HP. Spencer Stationary systems are used in industry up to 100 HP.

1½ HP PORTABLE

However, when low pressure air is needed for gas boosters, oil burners, glass cooling, paint spraying, you will find the Spencer Turbo Compressor a recognized standard. Bulletins on request.

See Spencer at Booth No. 921

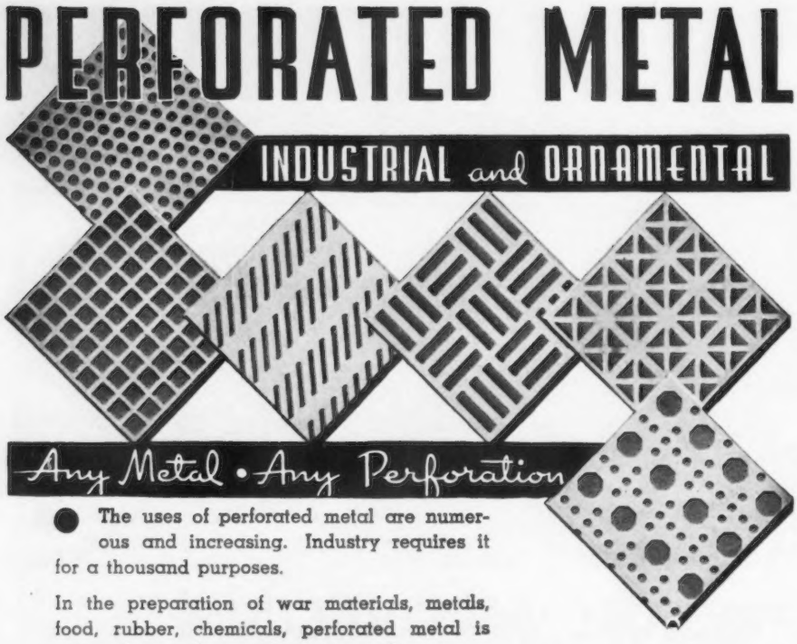
276-E

SPENCER HARTFORD VACUUM CLEANING

THE SPENCER TURBINE COMPANY, HARTFORD 6, CONN.

PERFORATED METAL

INDUSTRIAL and ORNAMENTAL



Any Metal • Any Perforation

● The uses of perforated metal are numerous and increasing. Industry requires it for a thousand purposes.

In the preparation of war materials, metals, food, rubber, chemicals, perforated metal is required to perform an important role.

The Harrington & King PERFORATING Co.

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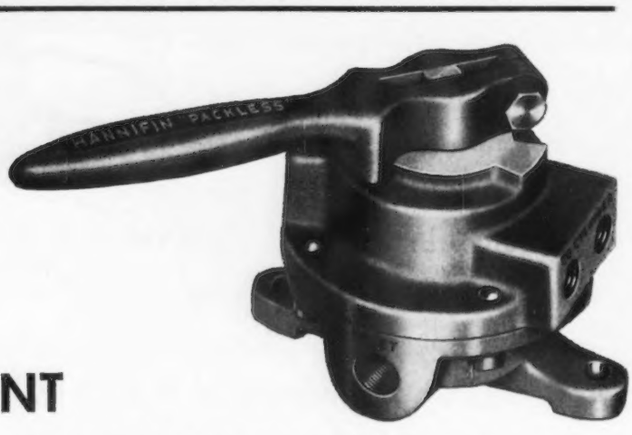
Eastern Office, 114 Liberty Street, New York 6, N. Y.



PREVENT
Leakage and Waste of Air Power

Hannifin Air Control Valves have no packing—and no leakage or packing maintenance troubles. This simple disc-type design has the bronze disc ground and lapped to form a perfect seal with the seat, which is similarly finished. The smooth-acting, positive control of air operated equipment means better performance. Made in 3-way and 4-way types, hand or foot operated, manifold, spring return, heavy duty rotary, and special models. Write for valve bulletin.

Hannifin Manufacturing Company, 621-631 South Kolmar Ave., Chicago 24, Illinois.

HANNIFIN AIR CONTROL VALVES

House Sends Limited OPA Bill to Senate

Washington

• • • **By a vote of 356 to 42,** the House passed and sent to the Senate a bill which extends the life of a drastically curbed OPA for an additional nine months. Hearings on extension are still being held by a Senate committee.

As approved by the lower chamber, the measure would:

Guarantee cost plus a "reasonable profit" to producers, processors, distributors and retailers of each commodity controlled;

Cut subsidy appropriations by 65 pct and require removal of all food subsidy payments under a set program which requires reductions of 25 pct every 45 days—thus ending food subsidies in 1946;

Allow wholesalers of all commodities whose business was curtailed by as much as 75 pct during the war to realize prewar profit margins by mark-ups and discounts; and

Make mandatory the lifting of price ceilings from a commodity within 10 days after certification by industry advisory committees or by the Secretary of Agriculture that the production for a 12-month period is equal to its production in the peak year of July 1, 1940 to June 30, 1941.

Completes New Coaches

Chicago

• • • **Pullman-Standard** Car Mfg. Co. has completed its first order of postwar built railroad passenger equipment with delivery of 20 new streamline coaches for the Chicago & North Western Railroad. The order was completed in 85 working days from laydown of the first car on Dec. 17.

Since VJ-day Pullman-Standard has delivered 32 passenger cars, including 20 for the North Western and 12 already accepted by the New York Central.

On order with the company are more than 1200 passenger cars. Construction on cars for three other railroads is now in progress at the plant here, which has not lost a single day of work during the reconversion period despite material shortages.

Gallup Polls

(CONTINUED FROM PAGE 105)

rationing in order to send food to people in other nations?"

The Replies

	Pct
Yes	59
No	36
No opinion	5

Willingness on the part of the majority to return to rationing is found to exist in all age groups, among both men and women, and among members of both major political parties.

The following table illustrates these facts:

	Yes Pct	No Pct	No op. Pct
By Sex			
Men	53	41	6
Women	64	31	5
By Ages			
21-29 yr	56	38	6
30-49 yr	60	35	5
50 and over	57	37	6
By Politics			
Democrats	65	31	4
Republicans	55	39	6

An earlier poll found that nine out of every ten are aware of plans to send food to other nations during the weeks ahead. The same poll further found slightly more than half of the families in the country saying they are already doing something to save on food.

These people say they are using leftovers, saving fats and drippings, growing their own vegetables, etc. However, this program, Mr. LaGuardia says, is inadequate.

According to Mr. LaGuardia, we should be sending 700,000 tons of wheat each month to Europe. Shipments have never been above 400,000 tons, and might, he said, drop as low as 225,000 tons in April.

London Economist

(CONTINUED FROM PAGE 111)

only the subsidiary voice that they allow to the Americans and the British in eastern Europe. Such a balance-sheet would not lead to a complete breach with Russia, nor would it involve appeasement; and it might give the British and American delegates a guiding thread to carry them through the maze of Soviet diplomacy.

How in concrete terms would such a balance-sheet apply to the issues under discussion in Paris next week? The first question is the drawing up of peace treaties for the satellite states in eastern Europe. The realism of the situa-

Better Steel Making

means

Better Steel CASTINGS

A "STRONG-CAST" CASTING *is one of undivided responsibility. Quality is rigidly guarded every step of the way—from watchful chemical and temperature laboratory-checks of each heat, to the careful annealing and cleaning operations on the finished casting.*

This quality control, plus modern steel casting equipment, such as our 25-ton, acid bottom, oil fired, open hearth furnace, are responsible for the high regard in which Strong Steel Castings are held in many vital industries.

It will pay you, in the interest of saving time, trouble and expense to become better acquainted with what Strong has to offer.

STRONG IN NAME
STRONG IN FACT

STRONG STEEL FOUNDRY COMPANY, BUFFALO, N.Y.

Strong

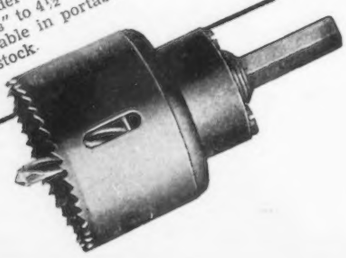
TENSILE STRENGTH · ELONGATION

Fast **Tough**

Heavy feed at high speed!

Heavy feed at high speed spells doom to the ordinary hack saw blade; down-time for your machine, extra expense in money, man hours, and production. The MARVEL Hack Saw Blade, because it is positively *unbreakable* under these conditions, should be "a must" tool in every efficiently operated shop. A tough alloy steel back is electrically welded to high speed steel teeth, producing a blade that can be pulled to almost unlimited tension; can withstand extra heavy feeds and the heat and abrasion of high speed heavy duty sawing.

The same exclusive *unbreakable* feature of MARVEL Hack Saw Blades is also a feature of MARVEL Hole Saws, giving these saws the ability to stand up under abuse. MARVEL Hole Saws cut holes from 5/8" to 4 1/2" diameter in stock up to 1 1/8" thick. Usable in portable drill, drill press, or lathe tail stock.



Complete Range of Metal Sawing Machines

Being the largest exclusive manufacturer of metal sawing machines and blades, both hack saw and band saw type, we have the correct answer to your cut-off problems. Each MARVEL model has a distinct application, so write us and we will send our catalog, price, and recommendation for the saw to fill your requirements most efficiently. MARVEL sawing engineers are also available to discuss and analyze your cut-off work. (Without obligation of course).

ARMSTRONG-BLUM MFG. CO.
5700 Bloomingdale Ave., Chicago 39, Illinois, U.S.A.

ERIE BUCKETS

General Purpose
Dredging and Hard Digging
Dragline
Material Handlers
Hook-on Type
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Coal and Coke
4-Rope
Barge Type
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√ **Strayer Electric**

Above types built in weights and capacities to suit your crane and job requirements.

THE COMPLETE LINE

Write for Data

865 GEIST ROAD

ERIE STEEL CONSTRUCTION CO.
ERIE, PENNSYLVANIA
Aggre Meters • Buckets • Concrete Plants • Traveling Cranes

tion is that Russian ideas, with or without a treaty, are going to have more influence in the Danube basin than American or British ideas. Meanwhile, the lack of treaties is an unsettling factor in eastern Europe. The Western Allies will not secure better terms or introduce more freedom by continuing to delay and to demand rather formal democratic guarantees. The only hope for greater freedom in eastern Europe is the restoration of some sort of political and economic stability. Until this degree of pacification is secured, the Communists will continue to play an extremist role and the opposition, favorable to the West, will be forced into sterile reaction.

THE Italian case is less straightforward. Italy lies quite clearly to the west of the dividing line, but sufficiently close to it to provide some justification for Russian interest in Italian affairs. For this reason it might be wise to make some concessions on certain points to Russian views. They might, for example, be given some measure of reparations—provided not only that the Americans and the British absolutely abstained, but also that their abstention were proclaimed to the Italian people. Yugoslav claims to reparations might also receive sympathetic consideration; Trieste might be internationalized and its hinterland ceded to Yugoslavia. But the same realism that would yield to Russia on these points would make the Western Powers stand firm on the other and major aspects of the Italian Treaty, particularly the control of the Mediterranean and the disposition of the Italian colonies. There is no more reason for Russia to be installed in Tripoli than for Britain or America to have bases in the Baltic States. Similarly, a transfer of any of the Dodecanese islands to Russian trusteeship is not a matter on which compromise is possible. There can be no assurance that the Russians would agree to such a bargaining over the Italian settlement. But if they did not, there would be a case for a separate Anglo-American treaty with Italy, so that the anomalies of the armistice could be brought to an end and the armies of occupation withdrawn. This would, of course, lead to separate Russian treaties with Hungary, Rumania and Bul-

garia; but if those treaties also led to the withdrawal of the Russian occupying forces, the result might not be wholly unfavorable to the chances of democracy—or at least of toleration—in those countries.

It is more difficult to forecast the course of the discussions on western Germany. France is here the recalcitrant minority and Russian policy is still unknown. But the formula of compromise on some points and firmness on others may serve the Americans and the British equally well here. The British and Americans can go a long way to meet the French on military and economic guarantees. There is no reason, for instance, why a subcommission of the Central Control Commission should not be established at once to oversee the economic development of the Ruhr and to become the nucleus of a permanent supervisory organization. But, on the question of political separation and the establishment of "independent" states, there should be no weakening.

To know where to yield, and to know where to insist, will not saddle either Mr. Bevin or Mr. Byrnes with an inflexible policy. Between the line of Russia's absolute interests and those of Britain and America there is a fairly wide debatable ground where concession and compromise could, given an improvement in the international atmosphere, be usefully carried on. The weakness of the Western Powers, hitherto, is that they do not appear to have decided where their paramount interests lie, or at least they have been chary of committing themselves. The result has been a Russian advance from prepared positions outward into the no-man's land of international debate and on into dangerous proximity to the western forward line. The only way of avoiding direct collision now is to state in a clear, yet friendly fashion, where the collision would inevitably occur—which is indirectly also a statement on the areas where cooperation, and not collision, are possible. If Mr. Bevin and Mr. Byrnes could bring this degree of clarity into Great Power relations, there would be less danger of their stumbling on each other and falling to fighting in the dark.

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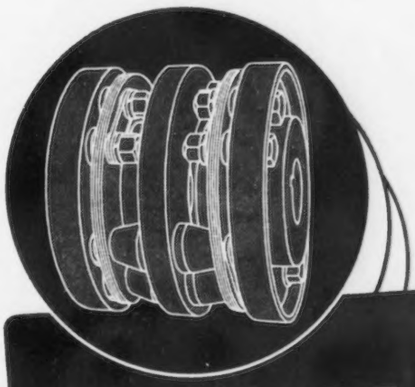

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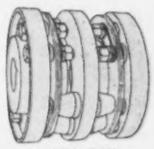
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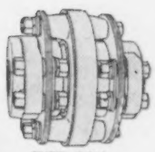
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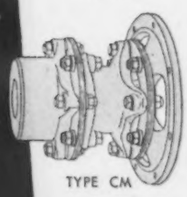
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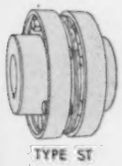
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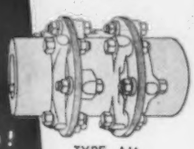
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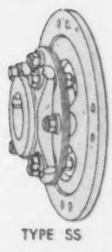
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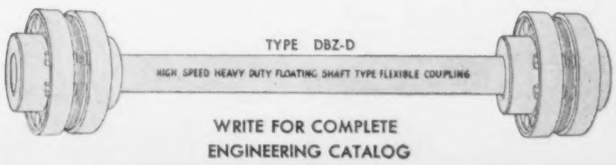
The Thomas All-Metal Coupling does not depend on springs, gears, rubber or grids to drive. All power is transmitted by direct pull.



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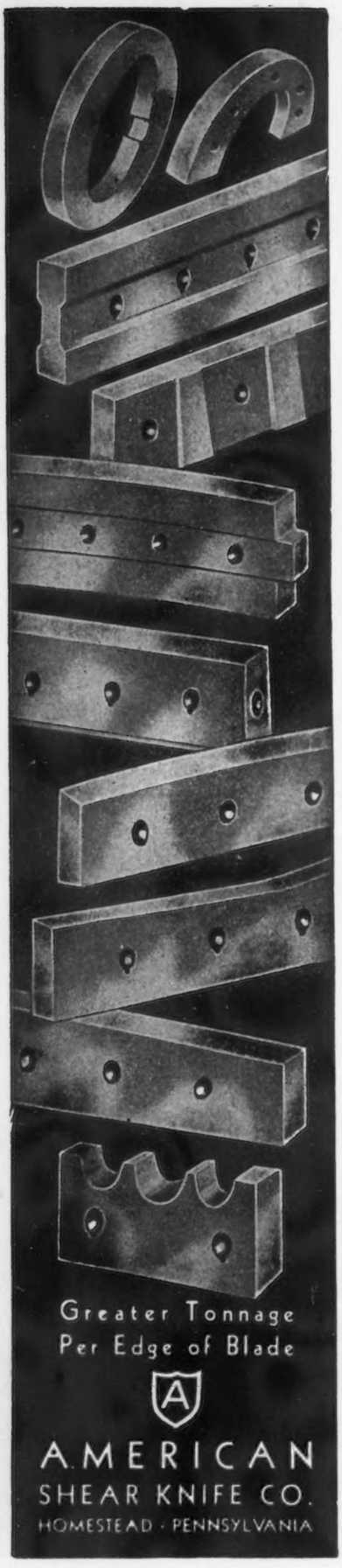


Rustproof Method Aids Paint Bond, Protects Steel in Fabrication

Pittsburgh

• • • **A new low cost** rustproofing technique for steel and galvanized steel, known as the Banox process, has been announced by Calgon, Inc., Pittsburgh, which is said to protect metal during the manufacturing stages, permit a tighter bond with paints and provide longer life through enhanced corrosion resistance.

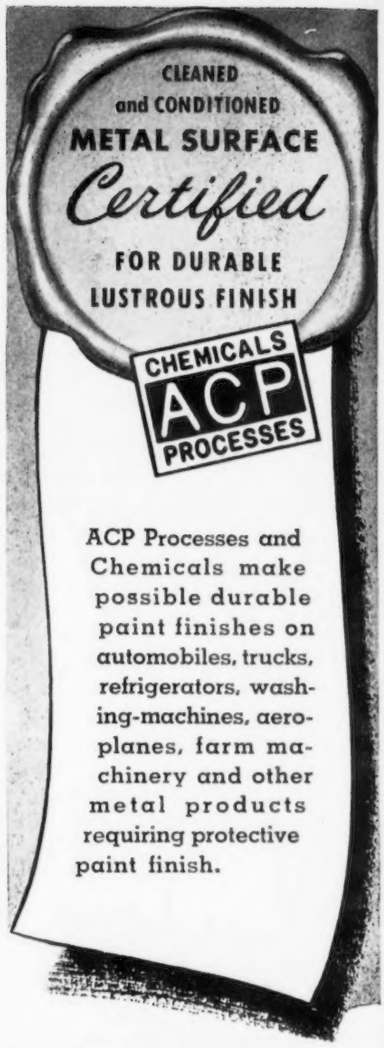
The basis of this chemical process is a flexible, glassy metal phosphate coating, so plastic that it is said to bend with the steel or permit die stamping without harm to the coating, according to the company's claim. The coating, which has a thickness of from 0.000005 to 0.000015 in., may be put on by spray, immersion, or brush. It requires no heat.

The process promises some improvement in the finishing of automobiles, refrigerators, gas and electric ranges, deep-freezing units, stokers, household appliances, and other metal articles. Greater finish durability and a longer service-life is promised.

Considerable latitude in the coating time may be had by altering the working concentration. Good coatings have been produced in practice in as short a time as 10 sec at 80°F.

The treatment of steel by the Banox process is said by Calgon research men to accomplish four purposes: 1. Prevent rusting between cleaning and painting. 2. Insure a grease-free and alkali-free surface, providing for maximum adherence and flexibility of organic finishes. 3. Greatly increase the durability of the finish as measured by outdoor exposure, salt-spray, "sweat box" humidity, and water immersion tests. 4. Prevent spread of rust from unprotected edges, scratches and other areas where the basis metal is exposed.

Discovered in 1942, the new process was first tried out in giving a protective precoating for painted steel shell containers during the war. Formerly, the humid, salt atmosphere of the Pacific stripped paint, along with vital identification from containers. In overcoming this, the Banox treat-



COLD SPRAY-GRANODINE produces a dense smooth zinc phosphate coating that protects steel and paint for a durable, lustrous paint finish.

THERMOIL-GRANODINE creates a heavy coating of iron and manganese phosphate which when oiled retards corrosion and prevents excessive wear on friction surfaces. When painted provides unusual protection.

DURIDINE 210 B (formerly 210 B Deoxidine) assures proper cleaning and a thin, tight and relatively hard phosphate coating so essential to a bright enduring paint finish.

DEOXIDINES — Phosphoric acid metal cleaners. Remove rust and rusters and prepare metal surfaces properly for lasting paint finish.

LITHOFORM — a phosphate coating that bonds paint to galvanized, zinc or cadmium coated surfaces.

American Chemical Paint Co.
AMBLER ACP PENNA.

ment was completely successful.

This process is said to be a simple, effective and economical method for producing a protective phosphate coating on steel, zinc, and other metals. Inorganic and insoluble, it actually is a plastic glassy phosphate coating. It is said to be flexible and amorphous in contrast to the hard crystalline deposits obtained from phosphoric acid metal treatments. Relying on chemical rather than mechanical bonding, it holds organic finishes to the metal with great tenacity.

Maintenance difficulties which the Banox process is designed to correct are the rusting out of tanks and the scaling of spray nozzles and heating coils which in other processes may have to be taken out frequently for cleaning.

Banox coated steel is said to resist rusting in the plant atmosphere for periods up to several months, depending on weather conditions. This temporary protection of units or assemblies before painting is a part of its value. The rest lies in its ability to make better use of today's improved paints and lacquers. The surface of Banox-processed steel is relatively nonporous and high gloss smoother finishes are obtainable from thin paint films.

Dealers Get Brass Rise

Washington

• • • **OPA has cleared** the way for distributors of all brass mill products to pass along ceiling price increases granted producers recently. The increase in producers maximum prices, averaging about 1.5¢ per lb, became effective Apr. 1.

When producers' prices were increased, OPA intended that distributors should be allowed to pass on the increase as stated in the press release covering the action. However, it was found that the regulation covering distributors sales (MPR 408) permitted the pass-through only in direct mill shipments and deliveries of pipe and water tubes from warehouse stocks. The latest action, also effective Apr. 1, permits a similar price increase in warehouse shipments of all other brass mill products.

Only about 10 pct of the total output of brass mill products moves through warehouse outlets, OPA said.

For faster positive cleaning of ferrous metals—WYANDOTTE F. S.

Wyandotte F. S.* is a proven anodic or reverse current degreasing compound—especially made for the *complete* removal of "smut" and fabricating compounds prior to plating. It produces a chemically clean surface that insures a uniform, more durable electro deposit.

This balanced formulation helped speed war production. Now it's facilitating reconversion to civilian manufacture—saving time . . . conserving material . . . reducing costs.

Wyandotte F. S. offers fast and complete wetting action . . . superior "smut" removal qualities . . . high conductivity, assuring quick and efficient removal of fabricating compounds . . . controlled foaming . . . long life in solution.

For more information about Wyandotte F. S., call your Wyandotte Representative. He's waiting to show you how this and other Wyandotte Metal Cleaners can work to your complete satisfaction.

*Registered trade-mark

Wyandotte
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WYANDOTTE CHEMICALS CORPORATION • J. B. Ford Division
Wyandotte, Michigan • *Service Representatives in 88 Cities*

Canadian Steel Shortage Might Force Establishment of Priorities

Toronto

• • • **Canada is facing** serious problems in her reconversion and peacetime production programs owing to severe shortage of steel and other metals. At the present time there is an estimated shortage of steel of at least 500,000 tons, while demand is growing. Under existing conditions there appears little prospect of this discrepancy being overcome before the end of the year, thus manufacturing enterprise will be handicapped in production of consumer goods.

While Canada is facing this condition today, there is a possibility that the steel shortage may become even more acute over the next few months. The coal strike in the United States has not yet affected steel production in this country, but leading steelmakers state that their coal supply, wholly obtainable from the United States, is sufficient for only about six weeks, and within the next two weeks curtailment in steel production will be necessary unless coal is forthcoming in the immediate future. The steel strike in the United States earlier in the year resulted in a loss of steel to Canada of at least 200,000 tons, and there is little hope of this being made up this year.

Canada now has to cope with labor problems of her own in the domestic steel industry. Union leaders are demanding a minimum wage rate of $33.60 per week as well as a 40-hr week for labor, together with various other requirements which are far from satisfactory to the officials of Canadian steel companies. In one or two plants strike votes have been taken, but so far no walk-outs have occurred. However, the situation is critical, and action may be taken by the unions at any moment which will bring stoppage of iron and steel production. In the event of stoppage practically all industrial activities in the Dominion will be suspended. No large stocks of steel have been accumulated by industry, in fact this has been impossible because of shortages in all lines of steel that have prevailed throughout the war years and since J-V Day.

Canadian steel mills have been doing their utmost to meet the demand, but to date have been able to take care of only slightly more than 50 pct of requirements. Since the beginning of this year steelmakers have been allocating deliveries to consumers, taking care of the more urgent requirements with the idea of keeping as many customers supplied as possible. These efforts have enabled manufacturers to swing into peacetime production schedules, but on a somewhat restricted basis with the result that consumer goods are appearing in retail shops in small volume and far from sufficient to meet pressing consumer demands.

Should the coal strike in the United States be settled forthwith and labor troubles in Canada overcome without a walkout, it would be several weeks and possibly months before Canadian primary steel producers could materially step-up production to ease the supply. Steel mills in this country have been under heavy pressure for several years, with the result that furnaces have been kept in continuous operation when they should have been shut down for repairs. This condition has now reached the stage where further delay in repairs is impossible and a number of blast and steel furnaces now are down for these urgently needed repairs, and others are to follow.

While the government is cognizant of prevailing conditions in the steel industry it has not reached any decision regarding a remedy. At present, consideration is being given to the following: (1) Subsidized movement of tonnage to maintain Canadian steel plants at full capacity.

(2) Priority in all steel used in housing and farm implements.

(3) Control or (screening) of new export orders through export permits.

Another step, but one which the government is hesitating in taking, would be to ration steel by some system of priorities or essential

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178,364 Shares

Eaton Manufacturing Company

Common Shares

($4 Par Value)

Of the above mentioned 178,364 shares, 166,846 shares were subscribed for at the subscription price of $54 per share by the Common Shareholders of the Corporation, or their assigns. The 11,518 unsubscribed shares are to be purchased from the Corporation by the Underwriters, subject to the terms of the Underwriting Agreement summarized in the Prospectus.

Price $62 5/8 Per Share

Copies of the Prospectus may be obtained in any State only from such dealers participating in this issue as may legally offer this stock under the securities laws of such State.

Merrill Lynch, Pierce, Fenner & Beane

April 16, 1946

Head of a famous family

Distinctive, the World over, is the head of a Toledo Scale. In factories, dairies, mines or mills—wherever seen it means—*Accurate Weight.* For inside the Toledo head is that ingenious Toledo full-floating, double-pendulum device which balances weight against weight to give accurate weighings with split-second speed.

Today it is true, as it has been for more than thirty years, that "Toledo on your scale head means ACCURACY in your weighings."

Watch for this head—you'll see it where Accurate Weights are wanted.

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TOLEDO

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Our plant is equipped with all modern machine tools for the quantity production and prompt delivery of precision gears to customers' specifications.

We have many years of specialized experience in cutting gears for leading manufacturers of such diversified products as washing machines, machine tools, precision instruments, business machines, coal stokers, hoists and pumps, portable tools, etc., etc.

For quality gears in quantity, made precisely to your specifications — and delivered on time — get our estimate on your requirements.

PERKINS MAKES: Helical Gears, Bevel Gears, Ratchets, Worm Gears, Spiral Gears, Ground Thread Worms.

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PERKINS MACHINE & GEAR CO., SPRINGFIELD 2, MASS.

classifications. However, action of this nature would be taken only should there be a stoppage of steel production in Canada through strikes. Drastic screening of export orders for products made wholly or in part of Canadian steel, have been in force since early in January, but large orders for steel from export markets continue to pour in and are being turned down.

Appoints Modernization Committee for Steel

Paris

• • • **An official government** order has appointed an iron and steel modernization committee for France. The committee will be attached to the government Council for Modernization and Re-equipment appointed a few weeks ago.

The committee will consist of the following members:

Chairman: M. E. Roy, director general, Longwy Steelworks.

Vice-Chairman: M. Bureau, director, Iron and Steel Dept., Ministry of Industrial Production.

Referee: M. Latourte, mining engineer.

Assistant Referee: M. R. Martin, Iron and Steel Division of the Ministry of Industrial Production.

Members: M. Aron, temporary director of the Iron and Steel Institute.

M. Borgeaud, director of the North and East Steelworks.

M. Costel, secretary general of the Metalworkers' Union.

M. Damien, director general of the Denain and Anzin Steelworks.

M. Delaye-Raynal, director of Economic Planning at Ministry of Economy.

M. Grandpierre, assistant director of Micheville Steelworks.

M. Malcor, director of the Navy Steelworks.

M. J. Raty, chairman of the Iron Ore Workers' Union.

Quarterly Earnings Drop

Kokomo, Ind.

• • • **Net profits** of Continental Steel Corp. for the first quarter of 1946 were cut to $10,961, principally due to the steel strike, compared to $151,892 for the same period last year, the corporation's quarterly report showed.

Speed Urged in WAA Disposal Programs To Liquidate Assets

Washington

• • • **Immediate steps** should be taken to step up the WAA program sufficiently to dispose of this year $19 billion of the estimated $32 billion government surpluses, according to recommendations made by Howard Bruce, who has just completed a special study of the situation for the White House.

Pointing out that only about $2 billion worth had been disposed of by the end of February, 1946, Bruce said quicker disposals are necessary both in the interest of easing civilian shortages and as a curb on inflation.

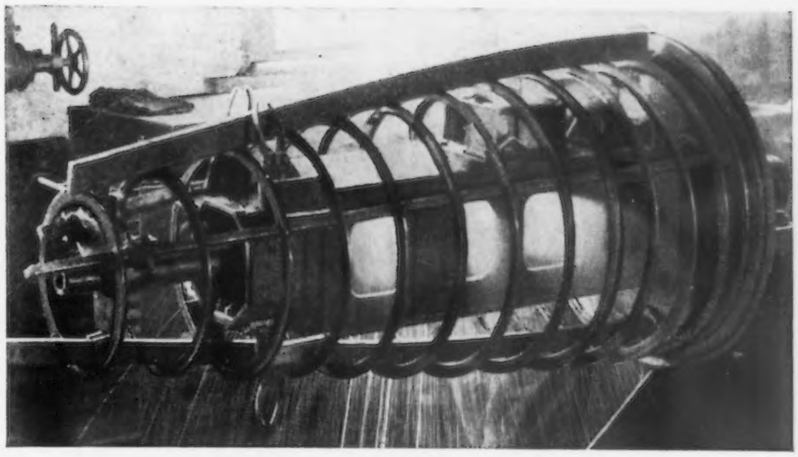
Dated Apr. 4, the report estimated the surplus goods in this country (overseas surpluses are handled by the Foreign Liquidation Commission) will total approximately $32 billion by June 30, 1947. Of this total, about $12 billion is in war plants and real estate and from $7-$10 billion in material which can be disposed of only as scrap. This would leave from $8 to $11 billion in producers and consumers goods which should be gotten into trade and consumer hands as rapidly as possible.

Describing the relatively new War Assets Administration's procedures and policies as "workable" and in which no major changes should be instituted at the present time, the report declared that within the organization a "greater sense of urgency" should be created with more sales outlets and more flexible methods set up.

Although present WAA personnel is able, the report went on, it is greatly understaffed and needs to be supplemented by qualified workers well versed in supervision of the decentralization program and spot checking as well as carrying on market research and development of uses for items.

Only by setting a goal of $19 billion for 1946 could the present inventory of $11.8 billion be reduced to $6.8 billion by Dec. 31 and to $1.6 billion by June 30, 1947.

Quarterly goals were recommended as: Second quarter, $5 billion; third quarter, $6 billion; and fourth quarter, $8 billion.



From a *torpedo after-body* . . . to your problem!

We're fed up with war and implements of war, too. So, actually, this isn't a martial message . . . the illustration simply demonstrates the versatility of King bending. Take a longer glance at the variety of diameters. King bends—the hard way—flanges from 8 inch diameter on, on up. Using, mark you, materials to and including 3 inch by 2 inch or 5 inch by 1 inch. Whatever your requirements, King can help you in a bending way . . . quickly, economically. If you haven't received your copy of the gaudy folder setting forth King facts, drop us a line and we'll get it to you before you can say, three times, "the swing is to King!"

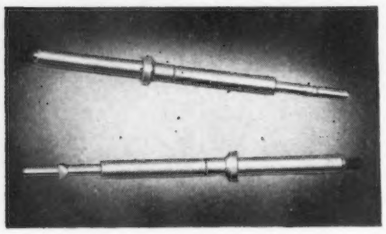
Our thanks to L. O. Koven and Brother, Inc., a good and valued King customer, for the use of the photo.

KING *Fifth Wheel* COMPANY

2917 N. Second Street, Philadelphia 33, Pa.

PRECISION PARTS

FROM STEM TO STERN



From the machining of the blank to the inspection of each finished piece, the production of these stainless-steel valve stems was a typical Ace job . . . typical in its accuracy, typical in its economy. The two main diameters were centerless ground to get a bearing surface with a 16-micro-inch finish. Transferred to a cylindrical grinder the radius and seat were ground to a fine finish and close tolerance. Concentricity of all diameters was held to ±.0002", and the seat had to fit a special gauge.

While each valve stem could have been produced entirely by cylindrical grinding, it was produced more economically by using a combination of centerless and cylindrical grinding.

Such accuracy and economy are part and parcel of our stock-in-trade . . . a nicely balanced blend of managerial skill and modern equipment that will produce such jobs economically, efficiently and in production quantities. If you are thinking of a source of supply for small parts and assemblies, it will pay you to consider Ace, where work progresses smoothly from the tool and die stage on through stamping, machining, heat-treating, and grinding. All these processes are carried out under a single roof, a single responsibility. Send us a sketch, blueprint, or sample for quotation.

This free booklet sent on request.

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for Precision Parts

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CPA Announces List Of District Offices Handling Non-Housing

Washington

• • • **Addresses of District** Construction Offices which have been established to handle applications under the Civilian Production Administration's order controlling construction (Veterans Housing Program Order 1, Mar. 26) have been released by CPA.

These district construction offices have one function only, which is the handling of area non-housing construction problems. (Queries and applications dealing with urban housing — non-veteran as well as veteran—are handled by the local Federal Housing Administration offices; matters dealing with farm housing or other farm construction are handled through the county agricultural conservation committees.)

No CPA activities other than non-housing and non-farm construction come within the authority of the CPA district construction offices. Persons having questions on matters over which the CPA has authority, other than on construction, are advised to contact the CPA, Social Security Bldg., Washington, D. C. Their questions cannot be handled in the field construction offices, which are set up only to handle matters relative to the order controlling construction, the Veterans Housing Program Order 1.

OFFICE ADDRESSES OF DISTRICT CONSTRUCTION MANAGERS

Region 1 (Maine, Vermont, Rhode Island, New Hampshire, Massachusetts, Connecticut)

Boston — 55 Tremont St (William P. Homans).
Hartford—119 Ann St. (Bruce Macmillan).

Region 2 (New York, New Jersey, Maryland, Pennsylvania, Delaware, District of Columbia including Arlington and Fairfax Counties, Virginia)

New York—43rd Floor, Empire State Bldg. (W. Arthur Riehl).
Buffalo—1142 Rand Bldg. (Earl R. Mason).
Albany—Room 1206, 112 State St. (F. J. Holman).
Newark, N. J.—20 Washington Pl. (John A. McNulty).
Camden, N. J. — Post Office (Frederick Cohen).
Philadelphia — Broad St. Station Bldg. (J. M. Leonard).
Pittsburgh—1810 First National Bank Bldg. (J. F. Stephens).
Wilmington, Del.—Room 301, Pennsylvania Office Bldg. (R. W. Willis).
Baltimore—Room 305, 22 Light St. (O. W. Carman).
Washington, D. C.—Room 2051, Social Security Bldg. (Edward H. Synan).

Region 3 (Ohio, Kentucky, Michigan, West Virginia)

Cleveland — 1289 Union Commerce Bldg. (Glen W. Thompson).
Columbus, Ohio — 1037 North High St. (Louis W. Gehring).
Cincinnati—6th Floor, Big Four Bldg. (J. Thomas Grace).
Toledo—Room 15, Old Post Office Bldg. (Vernon H. Pfaender).
Detroit—800 Boulevard Bldg. (John D. McGillis).
Louisville—Wave Bldg. (Henry Edson).
Charleston, W. Va.—c/o FHA, Chamber of Commerce Bldg. (Alex H. Copper).

Region 4 (Georgia, North Carolina, Alabama, Tennessee, South Carolina, Mississippi, Florida, Virginia)

Atlanta — 1608 Candler Bldg. (John B. Reeves).
Richmond, Va.—906 North Lombard St. (O. W. McCullough).
Greensboro, N. C. — 1105 Guilford Bldg. (Chester Q. Ensign).
Columbia, S. C.—108 South Gregg St. (Albert H. Douglas).
Jackson, Miss.—2951 Council Circle (A. G. McIntosh).
Jacksonville, Fla.—c/o PBA, P.O. Box-4910 (C. L. Ledford).
Tampa, Fla—3116 Oaklyn Ave. (P. Campbell Smith).
Miami, Fla.—3rd Floor, City Hall, Coral Gables (Clifford W. Street).

Region 5 (Illinois, Wisconsin, Indiana)

Chicago—226 West Jackson Blvd. (W. Fred Stevens).
Indianapolis—826 Circle Tower (Albert O. Evans).
Milwaukee—312 East Wisconsin Ave. (R. R. Valier).

Region 6 (Missouri, Nebraska, Iowa, Kansas, Arkansas, Colorado)

St. Louis—410 Old Customs House (Robert B. Miller).
Little Rock, Ark.—c/o FHA, Old Post Office Bldg. (Sam G. Davies).
Des Moines, Iowa—708 Liberty Bldg. (H. O. Parsons).

"JUNGLE AIRBORNE BUGGY: *This is Britain's version of the American jeep. Built by the Standard Motor Co. for the Ministry of Mechanisation, the jungle jeep is powered by an 8 hp engine and has 4-wheel drive. When crossing streams, the "Jab" floats in its own trailer.*

Denver—523 Continental Oil Bldg. (Norman J. Castellan).
Topeka, Kan.—c/o FHA, Topeka National Bank Bldg. (Alga Nothern).

Region 7 (Texas, Oklahoma, Louisiana, New Mexico)

Dallas—1221 Mercantile Bank Bldg. (George L. Noble).
Fort Worth, Tex.—Chamber of Commerce Bldg. (Walter P. Camp).
Houston—Electric Bldg. (Edgar G. Goforth).
San Antonio—Transit Tower Bldg. (George W. Chambers).
Oklahoma City—c/o FHA, Cotton Exchange Bldg. (Merwin T. Buxton).
New Orleans — Room 407, Canal Bldg. (George A. Pettit).
Albuquerque, N. Mex.—436 North Hermosa Ave. (Murray H. Sprague).

Region 8 (Southern California, Arizona, Utah)

Los Angeles—Room 1220, 1031 South Broadway (Irving Dix).
San Diego, Calif. — 308 Broadway Bldg. (John Young).
Salt Lake City—310 Atlas Bldg. (Arnold M. Seiler).

Region 9 (Northern California, Washington, Oregon, Idaho, Nevada, Montana, Wyoming)

San Francisco—1355 Market St. (Gilbert H. Kneiss).
Boise, Idaho—Baird Bldg. (A. J. Wahl).

Region 10 (Minnesota, North Dakota, South Dakota)

Minneapolis—Midland Bank Bldg. (William L. Jensen).
Sioux Falls, S. Dak. — City Hall Bldg. (E. E. Seubert).

Offices in the cities listed below are being established. Contact may be made with the CPA District Construction Manager named below through the FHA local office.

Puerto Rico—Virgin Islands

(Under Washington, D. C., central office)
San Juan, P. R.—Ramon Montaner.

Region 1

Springfield, Mass.—Phillip W. Simons, 1597 Main St.
Bangor, Me.—Charles E. Walker, 8 Harlow St.
Providence—James Q. Dolan, 75 Winchester.
Burlington, Bt.—Edward H. Sargent, 42 Central St.
Manchester, N. H.—George C. Vaughan, 814 Elm St.

Region 3

Grand Rapids—Harry D. Rosenberg, 2175 Lake Drive S.E.

Region 4

Memphis, Tenn. — Leonard H. Dille, 677 Shrine Bldg.
Birmingham—Paul P. Henderson, Fourth Floor, Dixie Carlton Hotel, Third Ave. and 23rd St.

Region 7

Tulsa, Okla.—Carl Stevens, Citizens State Bank Bldg.

Region 8

Phoenix, Ariz.—Louis Myers, 108 Aluminum Plant Office Bldg., West Van Buren St.

Region 9

Seattle—Donald W. Carswell, 8306 18th St. N.W.
Spokane—Dewitt Wallace, North 120 Wall St.
Portland, Ore.—Nelson English, 210 Central Bldg.
Reno, Nev.—Edwin S. Bender, 56 Boyd Place.
Casper, Wyo.—Bayard C. Wilson, 845 South Beach St.

Region 10

Fargo, N. Dak.—Charles W. Randall, 210 Walker Bldg.

Hanna Gains in Quarter

Cleveland

• • • **M. A. Hanna Co.** has announced net profit of $1,020,471 for the first quarter of 1946, after all charges, including interest, depreciation and depletion, and provision for federal incomes taxes. This is equal, after dividend requirements on 95,500 shares of $4.25 preferred stock, to 89¢ per share on the 1,030,464 outstanding common shares. In the corresponding period last year, net profit amounted to $846,996.

TROXIDE

SOLVES PICKLING PROBLEM FOR MANUFACTURER OF FIRE-EXTINGUISHERS

A nationally known manufacturer (name on request) prefers and *uses* Troxide . . . after testing both the conventional acid solution and a Troxide solution in treating cold-drawn, heat-annealed steel cylinders. Here is why:

Using conventional acid solution	After changing to Troxide solution
Compelled to dump acid solution every twenty-four hours ... required two men for mixing and dumping.	Troxide solution dumped every two weeks . . . one man required for mixing and dumping.
Acid mist affected machinery, and spillage attacked floor . . . dangerous to workers.	No acid hazards with Troxide . . . no special clothing required for handling cylinders.
As acid strength diminished, pronounced etching was noted, ruining cylinders.	No etching occurred with Troxide. Action on good metal lessened uniformly with solution strength.

Conclusions

- **TROXIDE lasted 14 times as long as the conventional acid solution.**
- **TROXIDE saved manpower.**
- **TROXIDE saved metal.**
- **TROXIDE reduced rejects.**
- **TROXIDE protected workers and equipment from the dangers of acid mist.**
- **TROXIDE SAVED MONEY.**

Perhaps Troxide can do the same for you. What is your pickling problem? Let us solve your bright-dip problem, also. Just write "Troxide" on your business card and mail today.

TROXIDE

SUPPLIERS: { South, Midwest and West—Waverly Petroleum Products Co., Drexel Bldg., Phila. 6, Pa.
East—Safety and Maintenance Co., Inc., 601 W. 26th Street, New York 1, N. Y.

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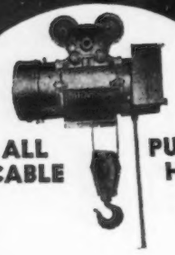

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and a Faithful Horse for *Control* and *Dependability*.

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LISBON HOIST & CRANE COMPANY
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LISBON, OHIO

Youngstown Welding Develops New Type Mechanical Pickler

Youngstown, Ohio

• • • **A new mechanical** pickler which automatically raises and lowers five to ten tons of steel bars at a predetermined, continuous rate, utilizing the practice of raising and lowering a sling full of bars in the pickling vat causing the bars to move one against the other, which cracks the oxide scale and aids in its removal, has been developed by the Youngstown Welding & Engineering Co.

Operation of the mechanical pickler is simple. Two horizontal shafts at each side of the pickling tank are geared to a driving mechanism. Sheaves, fixed to the shafts, carry the chains. When the pickler is operating, the chains move; this causes rod bars and other stock being pickled to revolve against each other in the solution. In this way, all surfaces are exposed to action of the solution, and scale removal is speeded by the rubbing action.

When used for tubing, the Weldco pickler raises the tubes out of the solution and tilts them. Thus, the tubes are flushed out, providing a more vigorous pickling action on the inside surfaces of the tubes. The cycle of raising and lowering the shapes into the pickling solution can be regulated by simple adjustment, according to the requirements of the material being processed.

A product of many years' engineering experience in the pickling field, the new pickler is of standard design, but it is possible to fit the equipment into any type plant.

Modify Export Conditions

London

• • • **Owing to the** increasing quantities of British Government surplus machine tools becoming available for the re-equipment of British industry, the Ministry of Supply and Aircraft Production has been able to modify export conditions.

The four-month period during which machines are on offer to British industrialists through the disposal centers is reduced to two months, and purchasers for export may acquire the machines at the same favorable prices as United Kingdom users. The new arrangements come into force at once and will help British exporters to re-establish trade abroad.

PROFITABLE DISARMAMENT: *Capt. Thomas H. Newman (right), deep sea fisherman, who with M. O. Scott, Miami scrap dealer, bought six World War I submarines for* **$40,000** *explains to Com. Leroy Moyer, USN, retired (left), aboard one of the craft, how they hope to make a large profit in the sale of scrap on the deal.*

Open Hearth Research Group Outlines Future Plans to Its Members

Pittsburgh

• • • **Results of a correlation study** of physical properties, both static and dynamic, with chemical analysis, heat treatment and working practice and the announcement of a new research program to investigate the characteristics of a series of high carbon heats were included in the agenda of the technical meeting of the Acid Open-Hearth Research Assn. Inc., held in Pittsburgh, recently.

B. B. Rosenbaum presented a summary of the recently completed investigation in which the working practice of 34 casting grade heats were correlated with physical properties. As would be expected, static properties were shown to be associated primarily with chemical analysis and heat treatment rather than with the method of making the heat. However, dynamic properties, as indicated by the notched bar impact test, varied widely for a given chemical composition. The effect of variations in furnace practice upon impact strength was discussed.

J. W. Linhart described a series of six consecutive high carbon heats which constitute the start of a new high carbon research program. The "melting-in" characteristics of these heats attracted considerable interest and it was concluded that the association's fluidity control procedure needs to be modified only slightly to be applicable. It was reported that one plant had already applied the association's fluidity control and the resulting heats were quite uniform in many respects. Specific recommendations were made to the plant in which these heats were made.

During the next two months, the staff will present educational courses for the association's plant personnel in the application of control procedures thus far developed by the association. Meetings will be held in Pittsburgh on Mar. 27 and 28 and in Philadelphia on Apr. 3 and 4, respectively, and will be open only to melt shop personnel of member companies.

The research staff now consists of four research engineers, one librarian, two chemists and one secretary, all working under the direction of Dr. G. R. Fitterer.

How do *YOU* measure manpower?

Does manpower in your welding department mean numbers of men — or do you, more logically, measure manpower in terms of production?

Because welding is becoming increasingly important in every phase of production today, it is important that your welding be done faster, better and more economically. If weldors are using cranes or spending time propping up, turning over and flopping their weldments, they are interrupting production and increasing costs on every foot of welding.

Investigate the demonstrated advantages of C-F Hand or Power-operated welding Positioners and see how they can help your weldors produce better, faster and more economical welding. Weldors can swing weldments into any position because every weld is downhand, larger electrodes can be used with resulting savings in time and material. For production welding, C-F Power-operated Positioners are unequalled—equipped with either variable or constant speed table rotation and power tilt, C-F Positioners have been setting new standards in production welding in many varied industries. Write for Bulletin WP-22 and more details. CULLEN-FRIESTEDT CO., 1303 S. Kilbourn Ave., Chicago 23, Ill.

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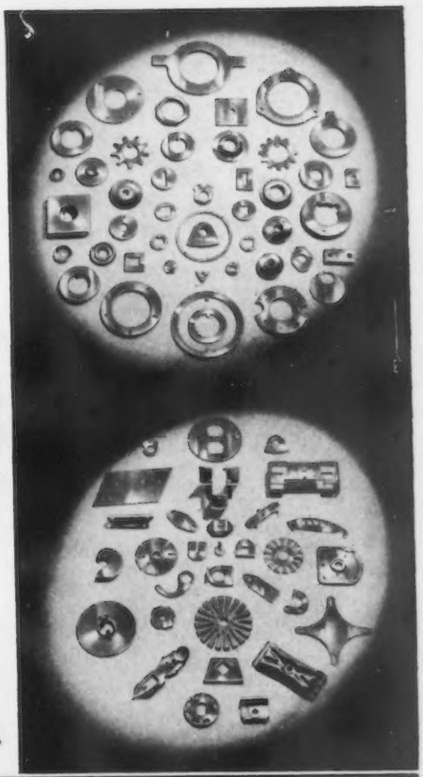

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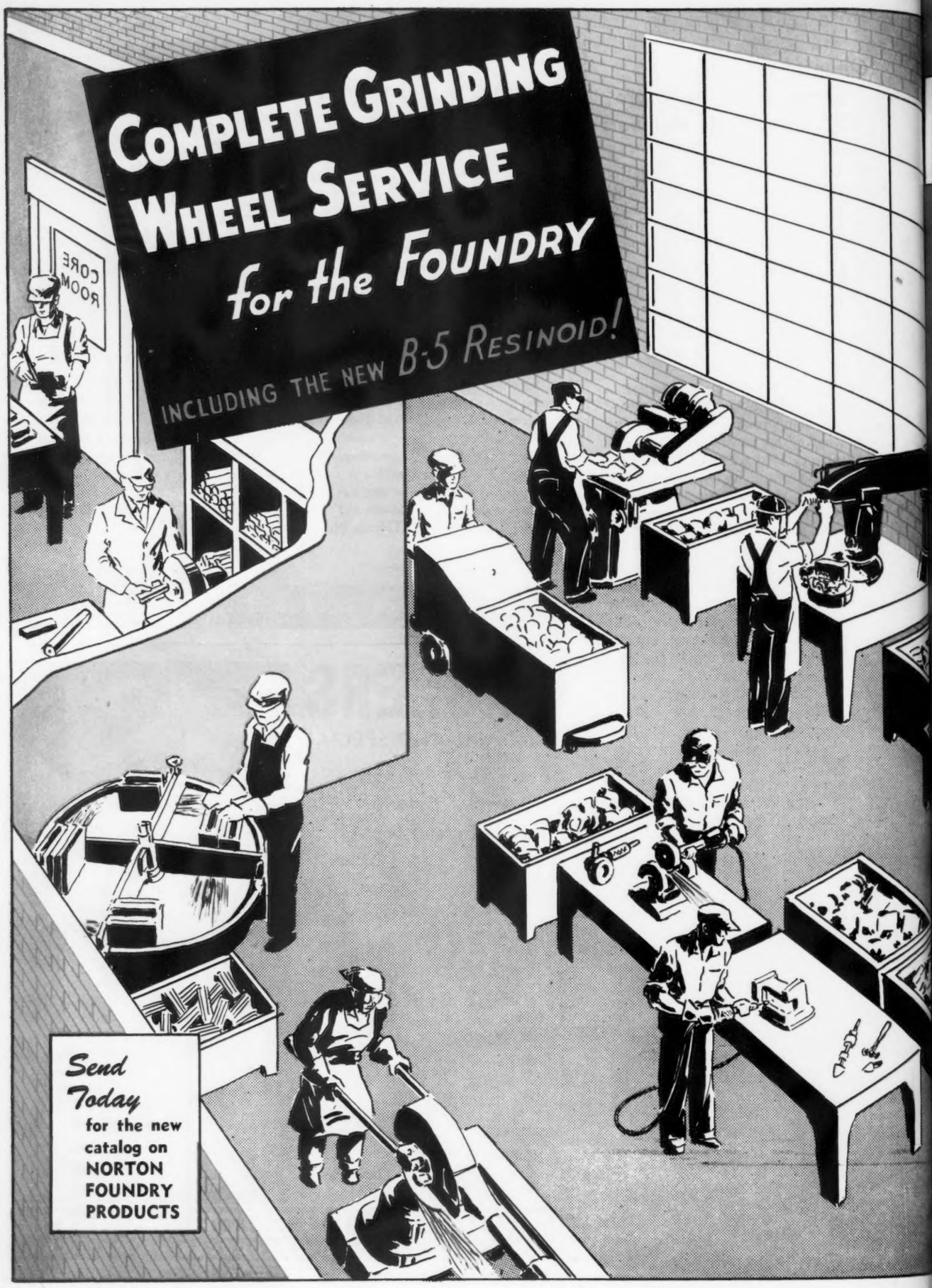
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